Beyond Groceries: Forecast Confidence and the Gender Gap in Inflation Expectations*

Lovisa Reiche†

February 8, 2025

Abstract

The gender gap in inflation expectations, women reporting systematically higher expectations in consumer surveys, has been attributed to traditional gender norms, and thus women's greater exposure to volatile food prices. This explanation overlooks a crucial factor: forecasting confidence. Using data from German households, I show that forecast confidence can fully explain the gender gap and the "grocery shopping" effect occurs only among those with low confidence. The interaction of confidence and shopping experience can be explained through the lens of a simple Bayesian learning framework, where noisy signals (such as price volatility) only increase mean expectations when priors are imprecise (forecast confidence is low).

Keywords Consumer Inflation Expectations, Gender, Uncertainty, Financial Literacy

JEL Codes E31, E71, G53, D84

*I am grateful to Michael McMahon, Alexandre Kohlhas and Ryan Rholes for their supervision and advice. Further, I thank Martin Weidner for his feedback on the econometric modelling in this paper and Dmitry Vinogradov, Nicolò Maffei Faccioli and Maya Haran for their excellent comments. This work has also benefited from the feedback of conference and seminar participants at the University of Copenhagen, the Royal Economic Society, Bocconi University, the University of Bamberg, the National Bank of Belgium, Norges Bank, the CEPR Symposium, Stanford University, University of Bergamo, the Mannheim Institute for Financial Education and the ifo Institute. Declarations of interest: none.

†University of Oxford, Department of Economics, Manor Road Building, OX1 3UQ, Oxford, UK
Email: lovisa.reiche@economics.ox.ac.uk

Introduction

The gender gap in inflation expectations is an established phenomenon. Using a 1977 survey of Swedish households, Jonung (1981) first found that women had significantly higher inflation perceptions, attributing this to their greater exposure to food prices which rose faster in the 1970s. Since then, the gap has been observed consistently across a wide range of geographies, survey designs and experimental settings.[1] On average, I find a gap of about 1.5pp. in Germany and 2pp. in the US, a substantial size given inflation targets around 2%. The gap is robust to controlling for observable demographics.[2] In addition, I document a second persistent gender gap: inflation uncertainty is higher for women than for men, as measured by the interquartile range of the density forecast.

Understanding the potential causes of gender gaps in inflation expectations is important. At the individual consumer level, higher inflation expectations have been associated with lower life satisfaction (Di Tella et al., 2001) and savings for retirement (Vellekoop & Wiederholt, 2019), for the latter the gender gap is an established fact (Lusardi & Mitchell, 2008). In addition, higher inflation expectations, associated with higher economic uncertainty (Reiche & Meyler, 2022), can reduce consumer spending (Coibion, Georgarakos, Gorodnichenko, & van Rooij, 2023; Coibion et al., 2024). Indeed, Bundesbank data presented here shows that the gender gap in inflation expectations is largely responsible for lower spending intentions of women, especially for major items and luxuries. This is of concern to central banks: women account for around 70% of consumer spending in advanced economies (Silverstein & Sayre, 2009), so their consumption-savings plans have large macroeconomic repercussions. There is an emerging literature on central bank communication with the general public, with the goal of managing household's inflation expectations (C. Binder, 2017; Coibion, Georgarakos, Gorodnichenko, & Weber, 2023; Coibion, Gorodnichenko, et al., 2023; Coibion et al., 2020, 2022; Lamla & Vinogradov, 2019). Women are shown to pay less attention to central bank media and have a more negative view of the institutions (McMahon & Reiche, 2025).

[1] Brischetto and de Brouwer (1999) for Australia; Bryan and Venkatu (2001) for a survey on Ohioan consumers; Palmqvist and Strömberg (2004) for Sweden, Pfajfar and Santoro (2010) for the US Michigan Survey; Blanchflower and MacCoille (2009) for the UK; Leung (2009) for New Zealand; Del Giovane et al. (2008) and Corduas (2022) for Italy; Bruine De Bruin et al. (2010) and Armantier et al. (2016) for the RAND American life panel; Arioli et al. (2017) and D'Acunto et al. (2024) for a range of EU countries; D'Acunto, Malmendier, and Weber (2021) for the Chicago Booth Expectations and Attitudes Survey; Dräger and Nghiem (2020) for Germany and Abildgren and Kuchler (2021) for Denmark are a non-exhaustive list of authors mentioning this empirical finding.

[2] Appendix E shows the gap over time in both countries with and without demographic controls. Appendix C shows that while older age, income, and education reduce the gender gap, even in combination they only close it for very extreme values.

The dominant interpretation of the gender gap is that traditional gender roles lead women to engage more in grocery shopping (D'Acunto, Malmendier, & Weber, 2021; Jonung, 1981), exposing them to more volatile price signals. This can cause overestimation due to a disproportional focus on price increases (Dräger et al., 2014). In this paper, I show that this difference in exposure to price signals alone is insufficient to explain the gender gap. Instead, I provide evidence for an additional mechanism: Consumers with low confidence in their own forecasting may be more dependent on price signals received during their grocery experiences as their priors for inflation are more imprecise. Thus, traditional gender norms are only relevant in explaining the gender gap for consumers with low confidence. In addition, a lack of confidence alone can cause higher average point forecasts if the prior is right-skewed, an assumption in line with observed density forecasts. Closing the confidence gap would close the gender gap fully.

To formalize this hypothesis, I employ a Bayesian framework with log-normally distributed signals and a conjugate log-normal prior. Grocery shopping, i.e. observing volatile prices, is reflected in an agent's signal volatility. As the noise of the unbiased signals increases, the expected value of the posterior distribution also increases, suggesting higher on average and more volatile expectations for women in traditional gender roles. This is a feature of the right-skewed log-normal distribution. However, this effect only occurs when the prior is flat. I interpret a flat prior as a sign of low forecast confidence: Those less inclined to rely on their own intuition have greater uncertainty around their prior beliefs. Simultaneously, low confidence can be a driver of inflation expectations when signals are sufficiently volatile. This highlights the role of confidence as a second relevant channel in explaining the gender gap.

An empirical analysis using data from the Bundesbank Online Panel – Households (BOP-HH, 2019-2022) shows that confidence is the dominant channel in explaining the gender gap: if women and men had the same forecasting confidence the gap would in fact be negative. However, grocery shopping increases mean expectations for people with low confidence, while having no effect for others. Since women often have lower confidence, partly explained by their lower financial knowledge, the effect of grocery shopping is amplified. This main empirical result is summarized in Figure 1, which shows the distribution of predicted forecast confidence measured through rounding among German male and female consumers, as well as the estimated effect of grocery shopping on inflation expectations. Grocery shopping significantly increases inflation expectations only for consumers with the lowest confidence in the forecast (bottom 11%), dominated by women.

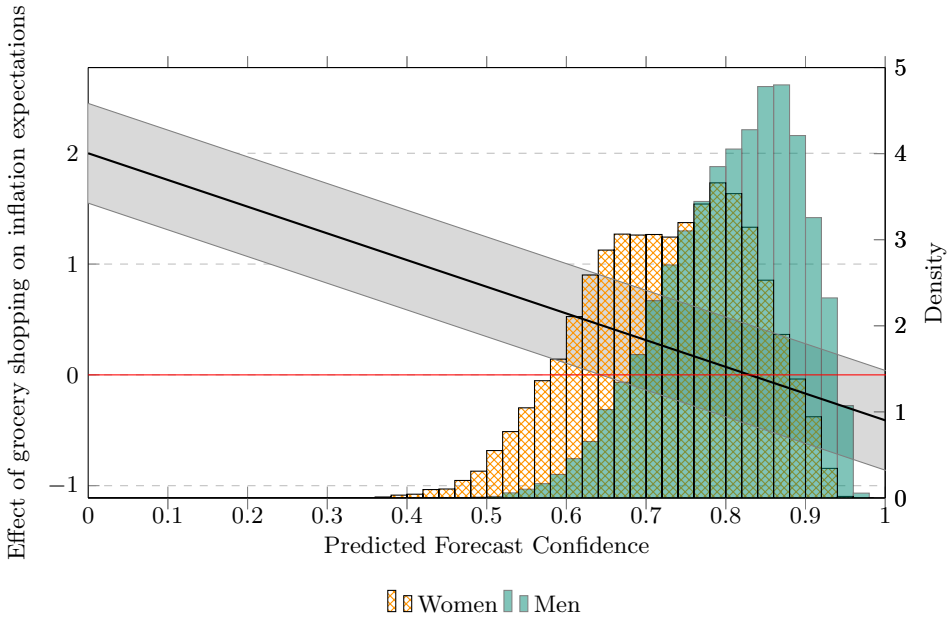


Figure 1: The effect of grocery shopping involvement on inflation expectations for different levels of forecast confidence

Notes: The predicted effect of participation in grocery shopping on inflation expectations for different levels of forecast confidence in the black line ($f(x) = 2.00 - 2.41x$). The complete regression results are shown in Table 4, column (5). The gray area indicates the standard error. The way grocery shopping is measured will be explained in Section 2.2 and confidence in Section 2.3. The histograms show the density of the male (green) and female (orange, cross-hatched) distribution of forecast confidence.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; own calculations

When possible, I complement the German data with evidence from the Survey of Consumer Expectations by the Federal Reserve Bank of New York (SCE, 2013-2020) and the Michigan Survey of Consumers (MSC, 1978-2023), both set in the US. This provides external validity for my results, geographically and historically. I provide evidence supporting the confidence channel by demonstrating that there is no gender gap in inflation expectations in the high confidence sample. In addition, removing outliers beyond the 80th percentile in the inflation expectations distribution completely closes the gender gap as suggested by the framework where the gap is driven by the right skew of expectations. As supplementary evidence against the experience channel, I show that (a) the gender gap persists for singles, who can be assumed to engage symmetrically in grocery shopping, and (b) periods of high food price inflation are not correlated with an increase in the gender gap. For those exercises, I use all three household panels. Further, data from the SCE shows that (c) the gender gap is smaller when asked about food price inflation specifically.

These findings extend beyond the gender gap alone. The gender gap is particularly persistent as it is caused by two drivers which interact with each other: women's lower confidence causes them to choose more rounded, higher forecasts and and rely more on the price signals they are exposed to which tend to me more volatile. Both factors increase their forecast uncertainty which assuming a right-skewed distribution increases posterior means. However, lower confidence is not just a phenomenon observed for women. It may also explain heterogeneity in forecasts between those with higher and lower educational attainment or between different age groups.

My results contribute to two areas of research: one that explains heterogeneity in inflation expectations through heterogeneity in signals and another that emphasizes the role of financial education and forecast uncertainty. Initially emphasized by Jonung (1981) and later formalized by the work of Malmendier and Nagel (2016), the heterogeneity of exposure to local price signals may matter and explain systematic demographic differences (Cavallo et al., 2017; D'Acunto, Malmendier, Ospina, & Weber, 2021; D'Acunto & Weber, 2024; D'Acunto et al., 2024; Weber et al., 2022). With regard to the gender gap, D'Acunto, Malmendier, and Weber (2021) show using intra-household data of heterosexual married couples that the gender gap is indeed most prevalent within households when men do not participate in grocery shopping, while in households with an equal share, the gap disappears. In contrast, heterogeneity may also arise due to lower forecast confidence of some consumers. C. C. Binder (2017) and Reiche and Meyler (2022) point out that forecaster uncertainty increases expectations mechanically in the low inflation period as it leads to rounding. Low confidence is a concept related to financial literacy. It is well known that there is a strong

connection between financial literacy and inflation expectations' central tendency (Bruine De Bruin et al., 2010; Burke & Manz, 2014; D'Acunto, Hoang, et al., 2022; D'Acunto et al., 2019) and forecast uncertainty (Bruine De Bruin et al., 2010). Further, women are thought to have lower financial literacy (Bucher-Koenen et al., 2017; Bucher-Koenen et al., 2024). I show firstly that the differential in financial literacy explains partially the observed gender gap in confidence, and secondly that this confidence gap is at the core for the experience channel to operate.

I contribute to both strands empirically as well as theoretically. My Bayesian framework captures the effects of the noisy information literature and shows that when the prior is log-normal, making signals noisier can increase the posterior mean without introducing biases. However, it links this to the forecast confidence literature by pointing out that for signal volatility to matter, priors need to be flat. Empirically, I show firstly that the differential in financial literacy explains partially the observed gender gap in confidence, and secondly that this confidence gap is at the core for the experience channel to operate. My results can be reconciled with the findings of D'Acunto, Malmendier, and Weber (2021) as women in "traditional" households differ from those who share household chores equally in their financial literacy and forecast confidence.

This paper is structured as follows: Section 1 introduces the Bayesian framework that highlights the mechanics of the experience and the confidence channel, Section 2 describes the data and measurement, Section 3 presents the key empirical results, namely how confidence is the dominant driver and experience matters only for those with low confidence, Section 4 provides evidence for financial literacy as a driver of the confidence gap and Section 5 provides further that the confidence channel dominates the experience channel. In Section 6 I highlight the consequences of the gender gap for spending intentions. Finally, Section 7 concludes.

1 Bayesian Framework

I start with a Bayesian framework to illustrate the two hypothesized channels causing the gender gap in inflation expectations: exposure and confidence. I model differences in exposure, such as grocery shopping activity, as differences in the distribution of the signals received. An agent who visits grocery stores frequently observes more volatile prices as food prices are fundamentally more volatile than the core component of the consumption basket (see Appendix B); hence, the agent will receive more volatile signals. On the other hand, I capture differences in confidence as differences in prior precision about future inflation. The

framework highlights how these two channels work in isolation and that they interact. An agent with less confidence will place less weight on their own forecast and so signals matter more as they become the dominant source of information about inflation. I first present the basic framework and then explore the impact of changes in signal and prior precision. For simplification, the framework is shown for a representative agent.

Let θ denote inflation 12 months ahead, an unknown random variable. The representative agent's prior belief about future inflation is assumed to follow a log-normal distribution, such that

$$\log \theta \sim \mathcal{N}\left(\mu_0, \frac{1}{\tau_0}\right).$$

Lower prior precision, i.e. a smaller τ_0 indicates lower confidence in the prior mean $\exp(\mu_0 + 1/(2\tau_0))$. The framework allows me to test the consequences of lower prior precision on the posterior mean and variance of an agent's inflation expectation.

In addition, the agent receives a signal x about future inflation. Signals are unbiased but contain some noise, reflecting heterogeneity in inflation experiences given by heterogeneous consumption baskets,

$$\log x = \log \theta + \epsilon,$$
$$\text{where } \epsilon \sim \mathcal{N}\left(0, \frac{1}{\tau_x}\right).$$

If the agent shops for goods with volatile prices (such as groceries, see Appendix B) she will receive signals with lower precision, i.e. with a smaller τ_x. Notice, that unbiasedness of signals allows me to show that signal volatility alone can affect mean expectations, such that purely by observing more volatile grocery prices an individual's inflation expectation can increase.

The log-normal prior is chosen because it is bounded at zero and features a heavy tail. This choice aligns with observations in the data: (1) there appears to be a zero lower bound in inflation expectations (Gorodnichenko & Sergeyev, n.d.);[3] (2) a majority of agents have expectations in line with central bank targets, but there are possible tail events to the right; (3) the average density forecast aligns with this choice (see Appendix Figure G.1). The signal about log inflation is unbiased and normally distributed. The asymmetry of the log-normal distribution is a key element of the framework. The framework can be extended to heterogeneous priors and biased signals as drivers of heterogeneous forecasts. The focus

[3] In the surveys used in the empirical section of this paper reaches from 0.002% in the BOP-HH to 3.24% in the MSC and 7.04% in the SCE. This is in line with estimates from the authors for a range of EU countries, the US and Japan. This feature is a feature of the chosen functional form, relaxing the zero lower bound would not impact the results as long as the asymmetry is retained.

here is to show that gender gaps in precision of prior and signals are sufficient for gender gaps in expectations to emerge.

The agent updates her beliefs about θ based on the observed signal using Bayes' rule (see Appendix A),

$$\log \theta | x \sim \mathcal{N}\left(\hat{\mu}, \frac{1}{\hat{\tau}}\right),$$

where $\hat{\mu}$ represents the mean of the logged posterior inflation expectations and $\hat{\tau}$ the corresponding precision given by:

$$\hat{\mu} = \frac{\tau_0 \mu_0 + \tau_x \log x}{\tau_0 + \tau_x}, \tag{1}$$

$$\hat{\tau} = \tau_0 + \tau_x. \tag{2}$$

The expected value of θ under the posterior distribution is simply the mean of its posterior distribution. It depends directly on the precision of priors and signals and thus on the agents confidence in her own beliefs and the price signals she receives:

$$\mathbb{E}(\theta|x) = \exp\left(\hat{\mu} + \frac{1}{2\hat{\tau}}\right) = \exp\left(\frac{\tau_0 \mu_0 + \tau_x \log x + \frac{1}{2}}{\tau_0 + \tau_x}\right). \tag{3}$$

Similarly, the posterior variance is given by

$$\mathbb{V}ar(\theta|x) = \left[\exp\left(\frac{1}{\hat{\tau}}\right) - 1\right] \exp\left(2\hat{\mu} + \frac{1}{\hat{\tau}}\right) \tag{4}$$

$$= \left[\exp\left(\frac{1}{\tau_0 + \tau_x}\right) - 1\right] \exp\left(\frac{2\tau_0 \mu_0 + 2\tau_x \log x + 1}{\tau_0 + \tau_x}\right). \tag{5}$$

The framework can be used to explain heterogeneity in observed point forecasts as well as density forecasts, particularly those between men and women. I show comparative statics for the effects of shocks to prior precision and signal variance. While using a representative agent framework for illustrative purposes, the framework can easily be interpreted as featuring two groups of agents. For instance, let women experience greater shocks to both prior precision and signal volatility due to lower forecast confidence and greater exposure to volatile food prices.

Beginning with the role of shopping experience, I assume that the composition of an agent's shopping basket may affect the signal precision parameter τ_x. Shopping for groceries

is thus connected to a lower τ_x. In this application, the signal remains unbiased; groceries are assumed to have the same level of inflation as other goods. The distribution of historical inflation of food prices and the total index can be found in Appendix B. The framework reveals that the expected inflation expectation as well as the variance thereof is increasing in signal volatility whenever $\log x$ exceeds μ_0 by less than half of the prior variance $\frac{1}{\tau_0}$.

$$\frac{d\mathbb{E}(\theta|x)}{d\tau_x} < 0 \iff \log x - \mu_0 < \frac{1}{2\tau_0} \tag{6}$$

Notice that the condition in (6) will always be satisfied when $\mu_0 > \log x$. This indicates that when consumers prior expectations exceed the signal, making the signal more volatile will always increase expectations since the signal becomes less reliable. In other words, those with high prior expectations do not revise them downwards if the price signals they receive become more volatile. Further, the condition relaxes when the prior is flat, i.e., prior precision τ_0 is small, such that the agent relies more on the signals received. When priors are sufficiently flat, the agent may revise her expectations upwards as signals become more volatile even when signals on average exceed the prior.

Further, equation 4 shows that under condition 6 it will also always be the case the variance is increasing in signal volatility. This is the case because the first term of equation 4 is monotonically increasing in $\frac{1}{\tau_x}$ while the second term is increasing under the same condition as the posterior mean in equation 3.

Proposition 1.1 *Consumer inflation expectations (and the uncertainty thereof) are increasing in signal volatility whenever* $\log x - \mu_0 < \frac{1}{2\tau_0}$. *This condition has two features:*

1. *The condition is always satisfied when average prior expectations exceed the average of the signal* $\mu_0 > \log x$.

2. *The condition relaxes when priors are imprecise and* τ_0 *is small.*

In summary, under the assumption of a log-normal signal and its conjugate prior, increases in the noise of the signals can indeed increase the expected value of the posterior distribution. This is the case because it increases the variance of the right-skewed density forecast. This captures and formalizes the argument of the experience hypothesis: women observing higher volatility through higher observed food prices have increased inflation expectations. However, this is facilitated by small prior precision. In contrast, a tight prior may cause mean expectations to decrease when the environment is noisier. Thus, it is important to analyze the consequences of prior heterogeneity, which may be caused by different levels

of confidence.

Confidence may impact the parameters of the prior distribution μ_0 and τ_0 such that an agent with lower confidence has a flatter prior, i.e. a lower τ_0. It has been shown that women have lower financial confidence (Bucher-Koenen et al., 2024).[4] Intuitively, individuals with low confidence may have a less formalized idea of price changes when observing prices. Subsequently, I will discuss the comparative statics of a decrease in τ_0 on $\mathbb{E}(\theta|x)$. The computations can be found in Appendix A.

$$\frac{d\mathbb{E}(\theta|x)}{d\tau_0} < 0 \iff \mu_0 - \log x < \frac{1}{2\tau_x} \tag{7}$$

Heterogeneity in priors can also give rise to heterogeneous expectations when signals received are identical. Reduced prior precision will always increase average expectations when signals exceed the prior. Similar to before, this makes the agent rely less on own forecasts and so the higher signals transmit directly to the expectations. Just as condition (6) relaxes with the prior being flat, condition (7) relaxes when signals are imprecise. Further, just as in the case of increased signal volatility, the same condition also ensures that the posterior variance will increase for the same reason as above.

Proposition 1.2 *Consumer inflation expectations (and uncertainty thereof) are increasing in prior imprecision whenever* $\mu_0 - \log x < \frac{1}{2\tau_x}$. *This condition has two features:*

1. *The condition is always satisfied when signals exceed the average of the prior* $\log x > \mu_0$.
2. *The condition relaxes when signals are volatile and* τ_x *is small.*

In the Bayesian framework with log-normal priors and signals, noisy environments caused by grocery shopping and low confidence can individually be a cause for higher inflation expectations. Moreover, they interact: The framework shows that noisy signals increase expectations when priors are flat. Simultaneously, low confidence (modeled as flat priors) increases expectations when signals are imprecise.

The conditions reveal that there is a combination of values for $\log x$, μ_0, τ_x and τ_0 for which both conditions, (6) and (7) hold: $\mu_0 \in [\log x - \frac{1}{2\tau_0}, \log x + \frac{1}{2\tau_x}]$. Outside of this interval at least one of the conditions will always hold.

[4]The authors show that women perform equally well in financial literacy tests when no "don't know" answer is provided, but worse when such option is not available.

Proposition 1.3 *For a given* $\log x$*, whenever* $\mu_0 \in [\log x - \frac{1}{2\tau_0}, \log x + \frac{1}{2\tau_x}]$ *the agent's inflation expectation* $\mathbb{E}(\theta|x)$ *are increasing in both, higher signal volatility* $\frac{1}{\tau_x}$ *and prior imprecision* $\frac{1}{\tau_0}$*. Otherwise, the agent's inflation expectation* $\mathbb{E}(\theta|x)$ *are increasing in either higher signal volatility* $\frac{1}{\tau_x}$ *or prior imprecision* $\frac{1}{\tau_0}$*.*

The framework is well suited to explain the interaction of the two channels hypothesized to explain the gender gap in inflation expectations. It shows that if women on average observe more volatile price signals through greater involvement in grocery shopping, they may have higher expectations than men. Similarly, if women on average have lower confidence about their own forecasts they could also have higher expectations. Both channels complement each other: observing volatile prices will increase expectations when the individual is less confident. This makes sense intuitively if those confident about inflation rely more on aggregate news while others rely more on their day-to-day experiences.

The remainder of this paper will show this complementarity empirically. For German consumers, there is an interaction effect between grocery shopping and confidence when predicting inflation expectations. Further, German and US data shows that the effect of confidence is dominating the contribution of grocery shopping to the observed gap.

2 Data

My primary data source is the Bundesbank Online Panel of German consumers from April 2019 until September 2022 (Research Data and Service Centre, 2022).[5] This survey is particularly suited to analyze the gender gap in inflation expectations because it contains individual-level data on household responsibilities including grocery shopping alongside more standard questions such as a probabilistic elicitation of inflation expectations and a financial literacy test, thus allowing me to test all hypotheses on the same individuals. Data for the BOP-HH has been collected regularly since April 2020. I use data until September 2022. In addition, there are three months of pilot phase from April-June 2019. Approximately 2000 participants are initially drawn randomly from a larger pool of candidates recruited via telephone. Participants complete an online survey with various questions ranging from macroeconomic assessments and expectations to political issues. Demographic characteristics are recorded by self-assessment; therefore, the terms "female" and "women" in my analysis refer to self-identified gender. The survey includes the option to not choose a binary gender and few candidates do so; these responses are excluded here. I also exclude all participants who do not give an inflation point forecast.

[5]Disclaimer: The results published and the related observations and analysis may not correspond to results or analysis of the data producers.

Survey	Time/Place	Participants	Wording
BOP-HH	Apr.2020-Sep.2022, DE	2000/month	*inflation/deflation* + (definition) from 0-100 + Probabilistic bins for inflation + Financial literacy test + Household responsibilities
SCE	Jun.2013-Nov.2020, US	1200/month	*inflation/deflation* from 0-100 + Probabilistic bins for inflation + Financial literacy test
MSC	Jan.1978-Dec.2022, US	500/month	*prices in general* from 0-95, probing > 5%

Table 1: Features of the three surveys

I complement this survey with two established consumer surveys, the Michigan Survey of Consumers in the US from June 1978 until January 2023 (MSC, Survey Research Center, 2023); and the Survey of Consumer Expectations in the US from June 2013 until November 2020 (SCE, Federal Reserve Bank of New York, 2020).[6] Adding these surveys allows me to explore a longer time horizon than the short period of the BOP-HH, which was also heavily influenced by the Covid-19 pandemic, and provides external validity by benchmarking results for the US. All surveys are summarized in Table 1 and summary statistics of the demographics can be found in Table 2 Panel A. Women in all surveys have marginally lower education and substantially lower reported household incomes. They are of similar age as men in the surveys. I control for these demographics as well as observations on employment in all regression models.

2.1 Measuring inflation point forecasts and uncertainty

The literature has established gender gaps in inflation point forecasts (Bryan & Venkatu, 2001; D'Acunto, Malmendier, & Weber, 2021; Jonung, 1981). The framework discussed above highlights that these gaps can arise through greater posterior variance in a right-skewed distribution caused by volatile signals or imprecise priors. Before discussing how to measure signals and priors, I focus on my measure of mean inflation expectations and the uncertainty around them.

Inflation expectations in all three surveys are measured quantitatively. In the BOP-HH, individuals are presented with a short definition of inflation[7] and are asked if they expect inflation or deflation in the next 12 months. Subsequently, they indicate their anticipated

[6]Disclaimer: FRBNY did not participate in or endorse this work, and FRBNY disclaims any responsibility or legal liability for the administration of the survey and the analysis and interpretation of data collected.

[7]Inflation is the percentage increase in the general price level. It is mostly measured using the consumer price index. A decrease in the price level is generally described as "deflation".

inflation or deflation rate numerically. The answers are limited to a range of 0 to 100. The SCE skips this definition but the wording remains the same while the MSC instead asks for prices in general. This can cause respondents to increase their forecast and is a less precise measure of inflation expectations (Armantier et al., 2013). I assume that the point forecast represents the mean of the respondents forecast. Armantier et al. (2013) find that these are indeed correlated with means and medians of density forecast, thus this assumption appears plausible.

Additionally, BOP-HH and SCE elicit uncertainty around the point forecast through probabilistic bins. Respondents are asked to assign probabilities to ranges or intervals of possible future inflation realizations. The lowest bin is smaller than -12% and the highest is higher than 12%. There are 10 bins in total. Figure G.1 in Appendix G shows the average density forecast in the BOP-HH. I use the probabilities of the reported bin to fit an underlying parametric density following the approach of Engelberg et al. (2009) and applied to the SCE as described in Armantier et al. (2017). The procedure is described in more detail in Appendix F. My uncertainty measure is the interquartile range of the density forecast, defined as the difference between the third and first quartile. This is preferred to the standard deviation as it is more robust to outliers.

Table 2 compares mean (π^E_point) and interquartile range (π^E_intqr) of inflation forecasts in Panel B. As anticipated, women hold both substantially higher point forecasts as well as greater uncertainty around them.

Observation 2.1 *There is an gender gap in inflation expectations in both means (point forecasts) and uncertainty around those forecasts.*

2.2 Measuring experience

Inference of differentiated experience is possible in the BOP-HH due to a question regarding household responsibilities introduced in April 2021, namely everyday purchases (*shop_groceries*) and financial decisions (*decide_finance*). Respondents indicate whether they are not involved in the task (0), engage jointly with other household members (0.5) or are solely responsible for all work (1). The focus of this analysis is the variable *shop_groceries* as it is a direct measure of whether an individual frequently observes food prices. Since the question is only asked for the first time an individual participates in the survey, I assume that household chores remain constant over time in the panel. Further, the variable is only asked for non-singles. Whenever grocery shopping is used in the analysis I include only households with more than one member. However, I use singles as a robustness measure as the men and

women in the single sample are assumed to engage symmetrically in grocery shopping.

The data reveal that traditional gender norms are still present in German households. Table 2 Panel C compares grocery shopping and financial decision making for men and women. As expected, women appear significantly more involved in grocery shopping in households that involve more than one member. Men in the data are less likely to live alone. However, I note that financial decision making is split equal between German and US couples, hence women make most purchasing decisions and are equally involved in the spending and investment decisions, making them a relevant group for central banks to analyze.

Observation 2.2 *Traditional gender norms persist in Germany. Women in the BOP-HH are more often responsible for grocery shopping in households with more than one member.*

2.3 Measuring confidence and financial literacy

I infer individual-level forecast confidence through a simple measure based on the linguistics literature: rounding. According to the "Round Numbers, Round Interpretations" hypothesis in linguistics (Krifka, 2007), individuals with low confidence in their ability to give a precise value use the nearest round number. In the context of inflation, this implies that those less confident in their ability to forecast future inflation may be inclined to predict inflation of around 0, 5 or 10 rather than more precise digits. This has been used by C. C. Binder (2017) and Reiche and Meyler (2022) to construct indices of macro-uncertainty by using the share of rounders in expectations surveys. Reiche and Meyler (2022) also show how rounding behavior is associated with higher inflation expectations at the individual level (almost mechanically in times of low inflation). In contrast, I am interpreting rounding behavior as a signal of low confidence in one's own forecast, in line with the concept of prior imprecision. This is different from posterior uncertainty, measured through the interquartile range of the probabilistic bins as explained above. Most participants give non-rounded responses, though Table 2 shows a clear gender divide with women rounding more frequently in all three surveys.[8]

To avoid the mechanical connection between rounding and high inflation expectations (though it is a somewhat lesser concern in times of high inflation), I compute a confidence measure based on rounding of other variables, such as house price expectations, interest rate expectations (in the BOP-HH) and government debt expectations (in the SCE) all 12 months

[8]The numbers differ from the findings of Reiche and Meyler (2022), who estimate a share of precise respondents of only around 25% in 2019 and after. One possible explanation for the difference could be that the authors use data from the European Commission Consumer Survey which records an inflation expectation of zero for all respondents, qualitatively indicating that inflation "will stay about the same". In contrast, the BOP-HH and SCE do not directly link qualitative and quantitative questions. This explains the lower share of "zero" respondents in both surveys, which are classified as "rounders" in the analysis.

ahead. Using these dummy variables (summarized in $R_{i,t}$ in Equation 8) as well as other household characteristics (summarized in $X_{i,t}$ in Equation 8). I predict the probability to round for inflation using a logistic regression (coefficients can be found in Appendix Table 15). The predicted probability to round shows a gender gap comparable to the raw measures of rounding. In the following analysis, I use one minus this measure such that 1 corresponds to high confidence:

$$\text{prob\_confident}_i = 1 - \frac{1}{1 + e^{-\left(\hat{\alpha}_0 + R_{i,t}\hat{\beta} + X_{i,t}\hat{\gamma}\right)}}. \tag{8}$$

To provide alternative measures of confidence, I include two questions on survey feedback (How easy was the survey?, How interesting was the survey?) as robustness exercises. Both show that women find the survey on inflation less interesting and more difficult then men. Table 2 Panel D shows that there are gender gaps in all confidence measures, actual rounding, predicted confidence measured as described above ans survey feedback.

Finally, I show that a lack of confidence as measured by rounding is a symptom of lower financial literacy of women. I utilize data from the SCE, which include micro-level financial literacy via a standardized financial literacy test (Lusardi & Mitchell, 2014).[9] I assign a score of 1 if a respondent answers all three questions covering compound interest, inflation, and risk correctly.[10] Correct answers earn one point each, while "don't know" responses are marked as incorrect.[11] Women are significantly less likely to obtain three correct answers, in line with previous observations in the literature (Bucher-Koenen et al., 2017).

Observation 2.3 *Women have lower confidence in their survey forecasts, find surveys on inflation less interesting/easy and perform worse in standardized financial literacy tests.*

2.4 Measuring spending intention

Lastly, the BOP-HH includes a regular question on the intention to spend on specific items in the next 12 months. These items include major goods, essential goods, clothing, entertainment and recreation, and financial reserves. Consumers choose if they expect to spend more (1), the same (0) or less (-1). In all categories, I find that women are more likely to cut expenses (see Panel E of Table 2). Cutting expenses can be associated with higher inflation expectations (Candia et al., 2020) or at least the uncertainty thereof (Coibion et al., 2024;

[9] Questions in Appendix H

[10] Detailed question wording can be found in the Appendix.

[11] The BOP-HH also included a similar financial literacy test. However, this is not used here as it was included only in one wave and it was found that most participants answer all three questions correctly (average score 2.8/3). Thus, there is too little variation to explore.

Reiche & Meyler, 2022). Hence, the gender gap in spending may be a consequence of the gender gap in inflation expectations. I show that this is the case in Section 6.

Observation 2.4 *Women are on average more likely to cut expenses on all items.*

3 The Effects of Confidence and Grocery Price Exposure

Heterogeneity in experiences and in confidence are not mutually exclusive hypotheses for explaining the gender gap in inflation expectations. The Bayesian framework in Section 1 demonstrates that these parameters are complementary: low confidence increases the impact of experiences, and the effect of a flat prior is amplified when signals are noisy. I start by demonstrating that confidence is the dominating river of the gender gap before showing that exposure does matter, but only through the lens of confidence.

3.1 Confidence dominates exposure

To test how the gender gap in inflation expectations evolves for different levels of confidence and grocery price exposure, I use a pooled OLS estimation and interact predicted confidence with the female dummy. Similarly, I include grocery shopping and interact it with the female dummy.
Gender Gap Specification:

$$\begin{aligned} \pi^E_{i,t} = \beta_0 + \beta_1 female_i + \beta_2 prob\_confident_{i,t} + \beta_3 shop\_groceries_i \\ + \beta_4 prob\_confident_{i,t} \times female_i + \beta_5 shop\_groceries_i \times female_i \\ + X_{i,t}\gamma_1 + D_t\gamma_2 + R_i\gamma_3 + v_i + \rho_t, \end{aligned} \tag{9}$$

In the above regression model, $\pi^E_{i,t}$ represents individual i's inflation expectations (12 months ahead, point forecast), $X_{i,t}$ is a vector of demographic characteristics (age, income, education, full-time, part-time, unemployed, retired, homemaker, refresher), D_t is a vector of time dummies and R_i is a vector of regional dummies. I focus on respondents in non-single households where the grocery shopping question is asked.

The results are summarized in Table 3. The interaction term of confidence and female is significantly negative in all three surveys. It shows that for average values of confidence for women (0.73 in the BOP-HH, 0.59 in the SCE and 0.5 in the MSC, see Table 2) the gender gap is closed in all three surveys. In fact, it is negative in the BOP-HH and the MSC. This indicates that women with low confidence have much higher expectations than their male counterparts but those with high confidence behave similar to men or may even underestimate. In contrast, the interaction with grocery shopping is insignificant. Robustness

Table 2: Summary Statistics for Men and Women

	BOP-HH		SCE		MSC	
	Men	Women	Men	Women	Men	Women
Panel A: Demographics						
age	56.61	55.59	52.58	49.08	46.68	47.46
	(15.45)	(15.37)	(15.21)	(15.81)	(17.07)	(17.47)
educ	8.69	8.17	4.53	4.33	4.14	3.96
	(3.46)	(3.44)	(1.53)	(1.5)	(1.29)	(1.26)
hhinc	7.59	6.89	7	5.96	68.2	50.4
	(2.52)	(2.59)	(2.66)	(2.71)	(73.6)	(56.3)
Panel B: Inflation forecasts						
π^E_point	4.87	6.36	4.11	6.31	4.05	5
	(5.84)	(8.91)	(8.82)	(14.9)	(5.29)	(7.03)
π^E_intqr	2.1	2.52	3.29	4.93		
	(2.44)	(3.06)	(3.69)	(5.33)		
Panel C: Household responsibilities						
shop_groceries	0.61	0.84				
	(0.39)	(0.29)				
decide_finance	0.76	0.74	0.63	0.67		
	(0.28)	(0.31)	(0.2)	(0.24)		
single	0.21	0.29	0.27	0.45	0.21	0.3
Panel D: Financial literacy and survey confidence						
round_π^E_point	0.19	0.28	0.24	0.44	0.42	0.54
prob_confident	0.81	0.73	0.78	0.59	0.61	0.5
	(0.08)	(0.1)	(0.16)	(0.22)	(0.11)	(0.12)
fin_lit			0.28	0.16		
			(0.2)	(0.14)		
qeasy	0.33	0.31				
	(0.31)	(0.31)				
qinterest	0.47	0.4	0.54	0.52		
	(0.33)	(0.34)	(0.32)	(0.32)		
Panel E: Spending Intentions						
clothing	−0.04	−0.13				
	(0.54)	(0.61)				
entertainment	0.07	0.04				
	(0.69)	(0.7)				
essential	0.01	−0.02				
	(0.39)	(0.44)				
major	−0.17	−0.21				
	(0.71)	(0.71)				
reserve	0	−0.02				
	(0.56)	(0.55)				

Standard deviation in parentheses, omitted for dummy variables.

Notes: Panel A: Education is measured categorically from 1-14 in the BOP-HH where it is the sum of school education (1-6) and professional education (1-8), 1-8 in the SCE and 1-6 in the MSC. Household income is categorical for BOP-HH (1-13) and SCE (1-11) and in thousands for MSC.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; University of Michigan, Survey Research Center, MSC, January 1978 - January 2023; own calculations

checks with alternative measures for experience and confidence that verify these results can be found in Appendix I in Table 14.

To test the contribution of confidence versus grocery shopping on the gender gap, I include an Oaxaca-Blinder decomposition (Blinder, 1973; Oaxaca, 1973). I run a baseline regression model of individual i's inflation expectation ($\pi^E_{i,t}$, point forecast, 12 months ahead) at time t on household characteristics $X_{i,t}$ as well as time and region fixed effects on the male and female samples separately. Denote the vector of average values of the independent variables for the female sample as $\bar{W}$, and for the male sample as $\bar{M}$ and the vector of estimated coefficients from the two samples as $\hat{\gamma}_w, \hat{\gamma}_m$. The difference in average inflation forecasts can then be decomposed as follows:

$$\pi^E_{i,t} = \beta_0 + X_{i,t}\gamma_1 + D_t\gamma_2 + R_i\gamma_3 + v_i + \rho_t, \tag{10}$$

$$\bar{\pi}^E_w - \bar{\pi}^E_m = \underbrace{\hat{\gamma}_w(\bar{W} - \bar{M})}_{\text{explained by differences in } \bar{W},\bar{M}} + \underbrace{\bar{M}(\hat{\gamma}_w - \hat{\gamma}_m)}_{\text{residual}}. \tag{11}$$

The first term on the right-hand side captures the share of the gender gap that is explained by differences in the model variables across men and women. The second term captures the residual, i.e. the unexplained gap. Figure 2 shows the decomposition of the four models in the BOP-HH. The first model only includes the demographic controls as well as a time dummy (base), hence the explained gap can arise because women have a different distribution of age, education or income while the unequal grocery shopping and confidence is part of the unexplained component. In a second model I also include grocery shopping on the right hand side, and in a third model I include confidence individually. Finally, the fourth model includes both. As the above regression results suggest, the gender gap is predicted to be negative if women and men had the same confidence and only becomes positive when confidence is not controlled for.

I include a single mediation model (MacKinnon, 2012; Tingley et al., 2014) as a robustness check in the last two columns of Figure 2. In the mediation model, the total gender gap (β_1 in Equation 12) is mediated by the explanatory variables in Equation 13 such that the mediated effect becomes: $\beta_1 - \beta_1'$. Equations 14 and 15 help attribute the mediated effect to the explanatory variables separately. The effect mediated through confidence is $\alpha^c_1\beta_2$ and the effect mediated through grocery shopping is $\alpha^g_1\beta_3$.

Table 3: Effect of confidence and grocery shopping on the gender gap

	Inflation expectation (12 months ahead, point estimate)				
	BOP-HH			SCE	MSC
	(1)	(2)	(3)	(4)	(5)
female	3.92***	1.09***	3.72***	1.46***	0.31
	(0.55)	(0.12)	(0.60)	(0.31)	(0.19)
prob_confident	−8.61***		−7.94***	−8.64***	−6.31***
	(0.77)		(0.82)	(0.37)	(0.48)
prob_confident:female	−4.37***		−4.38***	−2.48***	−0.66**
	(0.70)		(0.74)	(0.42)	(0.33)
shop_groceries		0.03	0.03		
		(0.09)	(0.12)		
shop_groceries:female		0.19	0.26		
		(0.16)	(0.20)		
age	−0.01**	−0.01***	−0.01**	0.01*	0.0004
	(0.003)	(0.003)	(0.003)	(0.004)	(0.001)
educ	−0.06***	−0.11***	−0.06***	0.03	−0.08***
	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)
hhinc	−0.10***	−0.21***	−0.09***	−0.12***	−0.0000***
	(0.02)	(0.01)	(0.02)	(0.02)	(0.0000)
full_time	−0.05	0.29***	−0.003	−0.29*	
	(0.14)	(0.11)	(0.15)	(0.15)	
part_time	−0.05	0.20	−0.03	−0.20	
	(0.15)	(0.13)	(0.16)	(0.15)	
retired	−0.28*	−0.19	−0.29*	−0.53***	
	(0.16)	(0.13)	(0.17)	(0.16)	
homemaker	−0.48*	0.94***	−0.04	0.22	
	(0.26)	(0.24)	(0.31)	(0.20)	
unemployed	1.33***	2.16***	1.52***	1.07***	
	(0.35)	(0.28)	(0.38)	(0.26)	
refresher	0.10	−0.21***	0.08	1.91**	
	(0.09)	(0.07)	(0.09)	(0.83)	
Constant	12.02***	5.94***	10.79***	11.60***	7.81***
	(0.67)	(0.40)	(0.65)	(0.49)	(0.38)
Observations	43,276	64,503	37,181	64,779	55,992
R^2	0.12	0.11	0.12	0.05	0.10

*p<0.1; **p<0.05; ***p<0.01
Standard errors in parentheses.

Notes: Regression coefficients from a pooled OLS estimation of individual 12-month-ahead inflation expectations. All regressions incorporate regional controls and time fixed effects.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; University of Michigan, Survey Research Center, MSC, January 1978 - January 2023; own calculations

$$\pi^E_{i,t} = \beta_0 + \beta_1 female_i + v_i + \rho_t \tag{12}$$

$$\pi^E_{i,t} = \beta'_0 + \beta'_1 female_i + \beta_2 prob\_confident_{i,t} + \beta_3 shop\_groceries_i + X_{i,t}\gamma_1 + D_t\gamma_2 + R_i\gamma_3 + v_i + \rho_t \tag{13}$$

$$prob\_confident_{i,t} = \alpha^c_0 + \alpha^c_1 female_i + v_i + \rho_t \tag{14}$$

$$shop\_groceries_i = \alpha^g_0 + \alpha^g_1 female_i + v_i + \rho_t \tag{15}$$

For grocery shopping, the model assigns only about 5% to the mediated effect (the same effect as the difference between the decomposition of only demographics and with groceries). However, the direct effect, similar in interpretation to the residual in the Oaxaca-Blinder decomposition becomes negative when confidence is used as mediating channel suggesting that confidence overexplains the gender gap and it would be negative if no gender gap in confidence existed. The regression results of the models specified above can be found in Table 4 discussed in the next section.

Result 3.1 *Differential exposure only explains about 5% of the gender gap. In contrast, confidence fully explains the gap, and it is negatively estimated for those with high confidence.*

3.2 Grocery price exposure matters when confidence is low

While the confidence channel dominates the exposure channel individually, the framework does predict an interaction of the two. I test the interaction of the individual-level confidence measure and grocery shopping with the following panel regression model:

$$\begin{aligned} \pi^E_{i,t} = \beta_0 + \beta_1 female_i + \beta_2 prob\_confident_{i,t} + \beta_3 shop\_groceries_i \\ +\beta_4 prob\_confident_{i,t} \times shop\_groceries_i + X_{i,t}\gamma_1 + D_t\gamma_2 + R_i\gamma_3 + v_i + \rho_t, \end{aligned} \tag{16}$$

where the variables are as explained above. Again, I exclude single households. The model is estimated using pooled OLS.

While the results in Table 4 show no role for grocery shopping in columns (3) and (4), confidence has a substantial impact on inflation expectations in all specifications. However, when interaction terms for experiences with uncertainty are included, the results show that experience does matter (column 5). Grocery shopping, initially insignificant, becomes significant with a negative and significant interaction term. A simple back-of-the-envelope calculation shows that for average values of confidence (0.81 for men and 0.73 for women) the predicted effect of grocery shopping is negative. The effect of grocery shopping is significant

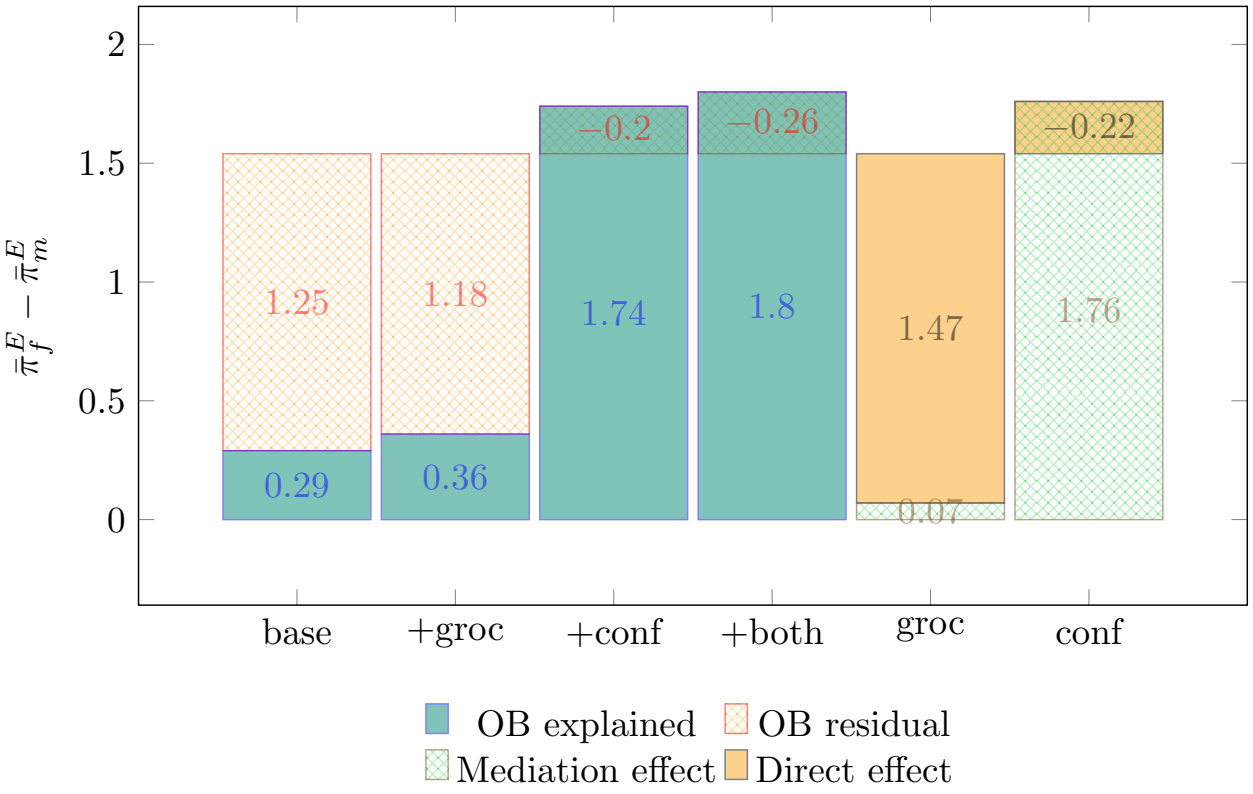


Figure 2: Decomposition of the gender gap

Notes: The left four columns show an Oaxaca-Blinder decomposition of the gender gap in inflation point forecasts when controlling for demographics only, grocery shopping, confidence or both. The right two columns decompose the gender gap in raw data into an average direct effect of gender on expectations (similar to a residual) and an average effect mediated through women's higher grocery shopping or confidence.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; own calculations

Table 4: Effect of experience and confidence on point forecasts

	Inflation expectation (12 months ahead, point estimate)					prob_confident	shop_groceries
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
female	1.32***	0.53***	1.29***	0.50***	0.50***	−0.07***	0.25***
	(0.08)	(0.09)	(0.08)	(0.09)	(0.09)	(0.001)	(0.004)
prob_confident		−10.67***		−10.67***	−9.07***		−0.05
		(0.68)		(0.68)	(0.91)		(0.04)
shop_groceries			0.13	0.12	2.00***	−0.001	
			(0.10)	(0.10)	(0.72)	(0.001)	
prob_confident x shop_groceries					−2.41***		
					(0.91)		
age	−0.01***	−0.01*	−0.01***	−0.01*	−0.01*	0.0005***	0.0004**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.0000)	(0.0002)
educ	−0.12***	−0.05***	−0.12***	−0.05***	−0.05***	0.01***	−0.001
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.0001)	(0.001)
hhinc	−0.19***	−0.09***	−0.19***	−0.09***	−0.09***	0.01***	−0.01***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.0001)	(0.001)
full_time	0.04	−0.03	0.04	−0.03	−0.03	−0.01***	−0.002
	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.001)	(0.01)
part_time	−0.06	−0.02	−0.07	−0.03	−0.04	0.003***	0.10***
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.001)	(0.01)
retired	−0.49***	−0.29	−0.49***	−0.29	−0.28	0.02***	−0.01
	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.001)	(0.01)
homemaker	0.27	0.02	0.25	−0.0001	−0.02	−0.02***	0.14***
	(0.31)	(0.31)	(0.31)	(0.31)	(0.31)	(0.002)	(0.02)
unemployed	1.59***	1.50***	1.58***	1.49***	1.48***	−0.01***	0.07***
	(0.38)	(0.38)	(0.38)	(0.38)	(0.38)	(0.003)	(0.02)
refresher	−0.17*	0.10	−0.17*	0.10	0.09	0.03***	0.01
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.001)	(0.005)
Constant	5.98***	12.87***	5.91***	12.80***	11.57***	0.65***	0.55***
	(0.33)	(0.55)	(0.33)	(0.55)	(0.72)	(0.003)	(0.02)
Observations	37,181	37,181	37,181	37,181	37,181	37,181	37,181
R^2	0.11	0.11	0.11	0.11	0.11	0.76	0.14

*p<0.1; **p<0.05; ***p<0.01
Standard errors in parentheses.

Notes: Coefficients from a pooled OLS regression of individual 12-month inflation expectations in the BOP-HH. The full model is specified in Equation (16). All regressions incorporate regional controls and time fixed effects. Singles are excluded in all models.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; own calculations

at the 95% confidence level only for respondents with forecast confidence below 0.64, i.e. those that are predicted to round with a probability greater than 36%., about 11% of all respondents though women dominate this group. Figure 1 visualizes this result. I include robustness checks for these results which employ alternative measures for forecast confidence and grocery shopping. These are discussed in Appendix I Table 12.

Result 3.2 *Grocery shopping increases inflation expectations only for a small share of consumers with low forecast confidence ($\sim$ 11%) which is dominated by women.*

3.3 Verifying the mechanism

In the framework, the reason why the interaction of volatile signals and imprecise priors increases point forecast is because both factors contribute to a higher variance in the right-skewed density forecast. Thus, I test whether the empirical results also hold when replacing the point forecast with the interquartile range of the density forecast on the left-hand side of the regression in Equation 16.

Table 5 shows that similar dynamics are at play for the joined effect of grocery shopping and forecast confidence as for the point forecast. Higher confidence reduces the interquartile range, a measure of uncertainty. While grocery shopping is insignificant in this specification, robustness checks with a dummy for rounding of inflation rather than probability to round (thus a more direct measure) show significance in the expected directions (Table 13). In the specification at hand, the mediated effect of shopping and confidence (57%) is dominated by the confidence effect.

Result 3.3 *Forecast uncertainty decreases in forecast confidence. Grocery shopping has a smaller effect, though it increases uncertainty for those with low confidence in their point forecasts.*

An implication of the confidence hypothesis is that the gender gap should disappear when the sample is trimmed to remove outliers in the right-skewed distribution. In the framework, the flat prior can affect the mean expectation only when the distribution is skewed to the right asymmetrically. To test this, I compute the gender gap across deciles of the expectations distribution, controlling for demographics and time periods in the three surveys. I replicate model (1) in Table 4 for each decile of the expectations distribution and test whether the gender gap closes when outliers are removed. Figure 3 plots the coefficient of *female* across percentiles, showing a steady increase as predicted by the uncertainty hypothesis. In samples limited to inflation expectations below the 50th percentile, no positive gender gap is observed. Conversely, for lower percentiles, the gender gap is negative. This finding is

Table 5: Effect of experience and confidence on forecast uncertainty

	Inflation expectation (12 months ahead, interquartile range)				
	(1)	(2)	(3)	(4)	(5)
female	0.23***	0.10***	0.22***	0.10**	0.10**
	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)
prob_confident		−1.69***		−1.69***	−2.05***
		(0.29)		(0.29)	(0.38)
shop_groceries			0.01	0.01	−0.41
			(0.04)	(0.04)	(0.30)
prob_confident x shop_groceries					0.54
					(0.38)
age	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
educ	−0.04***	−0.03***	−0.04***	−0.03***	−0.03***
	(0.004)	(0.005)	(0.004)	(0.005)	(0.005)
hhinc	−0.10***	−0.09***	−0.10***	−0.09***	−0.09***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
full_time	−0.05	−0.06	−0.05	−0.06	−0.06
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
part_time	−0.08	−0.08	−0.08	−0.08	−0.08
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
retired	0.04	0.07	0.04	0.07	0.07
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
homemaker	0.41***	0.37***	0.40***	0.37***	0.37***
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
unemployed	−0.03	−0.05	−0.03	−0.05	−0.05
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
refresher	−0.25***	−0.21***	−0.25***	−0.21***	−0.21***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Constant	4.46***	5.57***	4.46***	5.56***	5.83***
	(0.16)	(0.24)	(0.16)	(0.25)	(0.31)
Observations	31,793	31,793	31,793	31,793	31,793
R^2	0.05	0.06	0.05	0.06	0.06

*p<0.1; **p<0.05; ***p<0.01
Standard errors in parentheses.

Notes: Coefficients from a pooled OLS regression of the interquartile range of individual 12-month inflation density forecasts in the BOP-HH. All regressions incorporate regional controls and time fixed effects. Singles are excluded in all models.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; own calculations

in line with the confidence hypothesis as rounding for very low expectations can bias them downwards (saying 0% instead of 1 or 2%). The regression table is in the Appendix, Table 16.

Observation 3.4 *The gender gap in means is driven by the heavy tail in the female distribution. When the sample is restricted to the lowest 50% of inflation expectations, there is no positive gap and at lower percentiles a significantly negative gender gap emerges.*

4 Drivers of the Confidence Gap

Financial literacy is a potential driver of the confidence gap between men and women. The SCE includes a standardized financial literacy test (Lusardi & Mitchell, 2014). It is well known that women perform worse in those tests (Bucher-Koenen et al., 2017), at least when "don't know" answers are possible (Bucher-Koenen et al., 2024). The latter finding has been attributed to women being less confident when answering surveys about financial variables. Table 2 Panel D confirms lower financial literacy for women in the SCE.

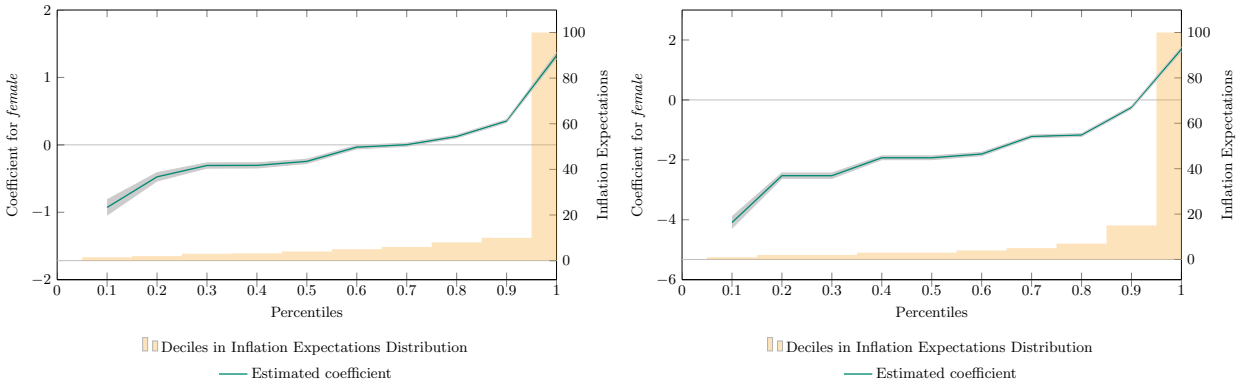
I test the effect of financial literacy on the gender gap in confidence through a simple regression of the predicted confidence on the female dummy, a range of demographics, and the test score of the financial literacy test. I also include an interaction of financial literacy and the female dummy. Table 6 column (3) shows that women with high financial literacy are less likely to round their point forecast on inflation. Further, when separating Table 3 by high and low financial literacy (columns (4) and (5) in Table 6), I find that the gender gap in inflation expectations disappears for those with high financial literacy. Confidence itself also has a larger impact irrespective of gender in the low literacy sample.

Result 4.1 *The gender gap in confidence is driven at least in parts by women's lower financial literacy.*

5 Further Evidence in Support of the Confidence Hypothesis

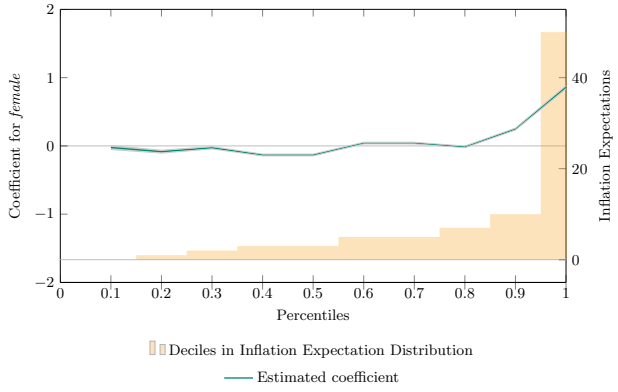
I conduct three further robustness checks of the pure experience hypothesis using all three available surveys:

1. **Singles Analysis**: I investigate whether the gender gap exists among singles. According to the experience hypothesis, there should be no gender gap among singles since both men and women engage symmetrically in grocery shopping when living alone. However, a financial confidence gap may still exist among singles, leading to asymmetric expectations despite symmetric shopping.



(a) BOP-HH

(b) SCE



(c) MSC

Figure 3: The gender gap along deciles in the inflation expectations distribution

Notes: Estimated regression coefficients for the dummy variable *female* in decile regressions of the inflation expectations distribution (0.1 to 0.9) across three surveys: BOP-HH, SEC, and MSC in the green line. 95% confidence bands are shaded in gray. Orange bars represent the percentiles in the inflation expectations distribution.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; University of Michigan, Survey Research Center, MSC, January 1978 - January 2023; own calculations

Table 6: The impact of financial literacy

	Predicted confidence			Inflation point forecast	
				High literacy	Low literacy
	(1)	(2)	(3)	(4)	(5)
female	−0.16***	−0.16***	−0.16***	−0.35	1.70***
	(0.001)	(0.001)	(0.001)	(0.36)	(0.33)
fin_lit		0.01***	−0.002		
		(0.001)	(0.002)		
fin_lit x female			0.02***		
			(0.002)		
prob_confident				−5.78***	−9.78***
				(0.39)	(0.42)
prob_confident x female				0.14	−2.91***
				(0.47)	(0.45)
age	−0.002***	−0.002***	−0.002***	0.02***	0.01***
	(0.0000)	(0.0000)	(0.0000)	(0.003)	(0.004)
educ	0.04***	0.04***	0.04***	0.07**	0.10***
	(0.0003)	(0.0003)	(0.0003)	(0.03)	(0.03)
hhinc	0.03***	0.03***	0.03***	−0.04**	−0.11***
	(0.0002)	(0.0002)	(0.0002)	(0.02)	(0.02)
full_time	0.001	0.001	0.001	0.06	−0.44***
	(0.002)	(0.002)	(0.002)	(0.15)	(0.15)
part_time	0.02***	0.02***	0.02***	0.02	−0.36**
	(0.002)	(0.002)	(0.002)	(0.15)	(0.15)
retired	0.05***	0.05***	0.05***	−0.22	−0.77***
	(0.002)	(0.002)	(0.002)	(0.16)	(0.16)
homemaker	0.03***	0.03***	0.03***	0.23	0.19
	(0.003)	(0.003)	(0.003)	(0.24)	(0.23)
unemployed	−0.02***	−0.02***	−0.02***	0.26	0.83***
	(0.003)	(0.003)	(0.003)	(0.26)	(0.24)
refresher	0.09***	0.08***	0.08***	0.12	1.35
	(0.01)	(0.01)	(0.01)	(1.52)	(0.84)
Constant	0.48***	0.48***	0.48***	5.80***	12.06***
	(0.01)	(0.01)	(0.01)	(1.75)	(0.52)
Observations	100,712	100,712	100,712	22,290	78,422
R^2	0.53	0.53	0.53	0.04	0.05

*p<0.1; **p<0.05; ***p<0.01
Standard errors in parentheses.

Notes: Columns 1-3: pooled OLS estimation of the predicted probability to round the inflation point forecast. Columns 4-5: Replication of column 5 in Table 3 for high and low financial literacy. All regressions include regional controls and time dummies.

Sources: Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; own calculations

2. **Food Price Inflation Periods**: I assess whether the gender gap widens during periods of high food price inflation, i.e. when women in traditional gender roles observe even higher price increases. This does not necessarily hold if financial confidence is the main channel causing the gender gap.

3. **Gender Gap of Specific Items**: I assess whether the gender gap differs when asked about different items in the consumption basket. If driven by grocery shopping, the gender gap should be largest when asked about food prices. In contrast, by the confidence hypothesis the gap can exist for different categories.

The rejection of all three support the confidence hypothesis proposed in this paper as a dominant driver of the gender gap.

5.1 The gender gap among singles

One implication of the pure experience hypothesis is that there should be no gender gap in inflation expectations for single men and women, as singles are likely to engage in grocery shopping irrespective of gender and thus should experience similar inflation levels and volatility. To test this, I run a panel regression of inflation expectations on a female dummy and other demographics as in column (1) of Table 4. I split the sample by household size. Under the experience hypothesis, the gender gap should be larger in the non-single sample as traditional gender norms don't exist for singles.

Table 7 shows that for all surveys (a) there is a persistent and significant gender gap for both, singles and non-singles and (b) it is not statistically smaller for singles. In fact, in the SCE the gender gap is larger for singles. This is novel evidence as D'Acunto, Malmendier, and Weber (2021) show no evidence for non-married and single individuals, and Jonung (1981) shows no treatment of disaggregated data.

Observation 5.1 *The gender gap is significant and no different between singles and non-singles.*

5.2 The gender gap correlated with historical food prices

Under the experience hypothesis, the gender gap is expected to widen in periods of higher food price inflation or price volatility compared to CPI core. This is because in those periods, household members with grocery shopping exposure observe particularly high and volatile prices which increases the bias and noisiness of their signals in the Bayesian learning framework.

Table 7: Comparing the gender gap in inflation expectations for singles and non-singles

	Inflation expectation (12 months ahead, point estimate)					
	BOP-HH		SCE		MSC	
	N	S	N	S	N	S
	(1)	(2)	(3)	(4)	(5)	(6)
female	1.33***	1.26***	1.44***	2.09***	0.85***	0.90***
	(0.05)	(0.09)	(0.09)	(0.14)	(0.03)	(0.05)
age	−0.01***	−0.01	0.02***	0.04***	−0.01***	−0.02***
	(0.002)	(0.004)	(0.004)	(0.01)	(0.001)	(0.001)
educ	−0.12***	−0.12***	−0.43***	−0.55***	−0.24***	−0.26***
	(0.01)	(0.01)	(0.03)	(0.05)	(0.01)	(0.02)
hhinc	−0.22***	−0.21***	−0.40***	−0.39***	−0.0000***	−0.0000***
	(0.01)	(0.03)	(0.02)	(0.03)	(0.0000)	(0.0000)
full_time	0.25**	0.28	−0.21	−0.69***		
	(0.10)	(0.19)	(0.15)	(0.22)		
part_time	0.11	0.34	−0.45***	−0.92***		
	(0.11)	(0.24)	(0.15)	(0.23)		
retired	−0.16	−0.01	−1.04***	−1.69***		
	(0.12)	(0.22)	(0.17)	(0.24)		
homemaker	0.39**	1.64***	−0.01	0.08		
	(0.19)	(0.49)	(0.21)	(0.50)		
unemployed	1.86***	0.13	1.42***	0.41		
	(0.25)	(0.34)	(0.27)	(0.33)		
refresher	−0.17***	−0.30**	−1.55***	−2.36***		
	(0.06)	(0.12)	(0.12)	(0.20)		
Constant	5.23***	4.81***	8.42***	8.30***	7.27***	7.37***
	(0.28)	(0.54)	(0.45)	(0.87)	(0.29)	(0.60)
Δ female	*0.08*		*-0.65****		*-0.04*	
	(0.11)		*(0.17)*		*(0.06)*	
Observations	80,425	26,431	74,641	41,328	195,107	66,268
R^2	0.11	0.10	0.03	0.03	0.13	0.10

*p<0.1; **p<0.05; ***p<0.01
Standard errors in parentheses.

Notes: Regression coefficients from a pooled OLS estimation of individual point forecasts of inflation (12 months ahead). N indicates households with more than 1 member and S indicates single households. The italics below indicate the gap between the coefficient on female in non-single and single samples along with the standard error. All regressions include regional controls and time dummies.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; University of Michigan, Survey Research Center, MSC, January 1978 - January 2023; own calculations

To analyze this, I use a regression model similar to the previous setup but replace time dummies with variables measuring the difference in food price inflation (CPI_t^{food}) and total inflation (CPI_t^{total}), as well as the moving coefficients of variation of these variables over a 6-month moving window ($\rho_{t,6}^{food} - \rho_{t,6}^{total}$).[12] The regression results are reported in Table 8. Under the experience hypothesis, the interaction terms with female should be positive. However, the analysis reveals that at least in the MSC, the longest running survey with the most time variation, these coefficients are significantly negative. This suggests that the gender gap in inflation expectations actually diminishes when food prices are very high relative to core inflation or volatile relative to core. In the BOP-HH and the SCE the effect is insignificant.

Observation 5.2 *The gender gap in point forecasts reduces in response to high or volatile food prices.*

5.3 The gender gap when forecasting of different baskets

Finally, I check if the gender gap is driven by a specific item in the consumption basket. I do so by comparing gender gaps in price expectations for different items from a standard basket, namely gas, food, college education, medical care and gold in the US. Under the experience hypothesis, the gender gap should be particularly large for food, as this has the most differential shopping experience in traditional households. However, the analysis in Table 9 shows that the gender gap is smaller for food than for the full basket. The only category for which it significantly increases is education. The categories with the smallest gender gaps are gas and gold. The gap is insignificant for both.

Observation 5.3 *The gender gap is smaller when asked about food prices than when asked about the full basket. It increases for inflation of educational services.*

6 Does the gender gap in inflation expectations matter for spending?

Finally, I explore the behavioral consequences of the gender gap in inflation expectations. The literature is divided on whether consumers adhere to the Euler equation. For instance, Dräger and Nghiem (2020) find supporting evidence using a new survey of German consumers, while Bachmann et al. (2015) show that spending intent (as measured in the MSC)

[12] The moving coefficient of variation is defined as $\rho_{t,n} = \frac{\sigma_{t,n}}{\bar{x_{t,n}}} \times 100$ where t denotes the current period, n is the number of periods over which to calculate the moving average and standard deviation, $\bar{x_{t,n}}$ is the moving average and $\sigma_{t,n}$ describes the moving standard deviation computed as Moving $\text{SD}_t = \sqrt{\frac{1}{n-1}\sum_{i=t-n+1}^{t}(x_i - \overline{x}_t)^2}$ where x_i is the value at time i.

Table 8: Microlevel effects of high food prices

	Inflation expectation (12 months ahead, point estimate)					
	BOP-HH		SCE		MSC	
female	1.37***	1.63***	1.66***	1.61***	0.75***	0.71***
	(0.05)	(0.08)	(0.08)	(0.16)	(0.02)	(0.04)
CPI_t^{food} - CPI_t^{total}	0.49***		0.04*		−0.06***	
	(0.01)		(0.02)		(0.01)	
female x (CPI_t^{food} - CPI_t^{total})	−0.01		−0.03		−0.09***	
	(0.02)		(0.03)		(0.01)	
$\rho_{t,6}^{food}$ - $\rho_{t,6}^{total}$	0.09***		−0.01		−0.03***	
	(0.01)		(0.01)		(0.01)	
female x ($\rho_{t,6}^{food}$ - $\rho_{t,6}^{total}$)	−0.01		0.01		−0.01	
	(0.01)		(0.02)		(0.01)	
CPI_t^{total}		0.69***		0.05		0.54***
		(0.01)		(0.06)		(0.01)
female x CPI_t^{total}		−0.07***		0.05		0.02***
		(0.01)		(0.09)		(0.01)
$\rho_{t,6}^{total}$		0.01*		0.001		−0.03***
		(0.01)		(0.02)		(0.01)
female x $\rho_{t,6}^{total}$		−0.005		0.01		0.01
		(0.01)		(0.03)		(0.02)
age	−0.005**	−0.01***	0.03***	0.03***	−0.02***	−0.01***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.001)	(0.001)
educ	−0.10***	−0.12***	−0.47***	−0.47***	−0.34***	−0.22***
	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)
hhinc	−0.19***	−0.21***	−0.40***	−0.40***	−0.0000***	−0.0000***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.0000)	(0.0000)
full_time	0.21**	0.25***	−0.38***	−0.39***		
	(0.09)	(0.09)	(0.13)	(0.13)		
part_time	0.11	0.17	−0.65***	−0.66***		
	(0.11)	(0.10)	(0.13)	(0.13)		
retired	−0.18*	−0.06	−1.32***	−1.33***		
	(0.11)	(0.11)	(0.14)	(0.14)		
homemaker	−0.34**	0.06	−0.10	−0.10		
	(0.17)	(0.17)	(0.20)	(0.20)		
unemployed	1.02***	1.11***	0.94***	0.94***		
	(0.20)	(0.20)	(0.21)	(0.21)		
single	−0.44***	−0.49***	−0.11	−0.11	−0.16***	−0.02
	(0.06)	(0.06)	(0.09)	(0.09)	(0.03)	(0.03)
refresher	0.75***	−0.30***	−1.82***	−1.82***		
	(0.05)	(0.05)	(0.10)	(0.10)		
Constant	6.22***	5.33***	9.26***	9.15***	7.13***	3.63***
	(0.16)	(0.16)	(0.25)	(0.27)	(0.06)	(0.06)
Observations	106,856	106,856	115,969	115,969	259,755	259,755
R^2	0.07	0.10	0.03	0.03	0.03	0.10

*p<0.1; **p<0.05; ***p<0.01
Standard errors in parentheses.

Notes: Regression coefficients from a pooled OLS estimation of individual inflation expectations (12 months ahead) including the difference between food and total inflation, and their moving coefficient of variation. Regional effects are included in all models.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; University of Michigan, Survey Research Center, MSC, January 1978 - January 2023; OECD, Prices: Consumer prices, Main Economic Indicators (database), January 1978 - January 2023; own calculations

Table 9: Expectations about specific prices

	Inflation expectation (12 months ahead, point estimate)						
	Full basket	Gas	Food	Education	Medical	Rent	Gold
female	1.68***	−0.60**	1.23***	−26.02	−26.37	1.98***	−0.61***
	(0.07)	(0.26)	(0.12)	(20.78)	(20.77)	(0.14)	(0.16)
age	0.03***	0.04***	0.06***	0.45	0.48	0.04***	0.03***
	(0.003)	(0.01)	(0.005)	(0.88)	(0.88)	(0.01)	(0.01)
educ	−0.48***	0.08	−0.23***	−4.42	−4.31	−0.45***	−0.22***
	(0.03)	(0.09)	(0.04)	(7.10)	(7.09)	(0.05)	(0.05)
hhinc	−0.39***	−0.10*	−0.33***	−6.41	−6.47	−0.43***	−0.39***
	(0.02)	(0.05)	(0.02)	(4.26)	(4.25)	(0.03)	(0.03)
full_time	−0.42***	0.26	−0.73***	35.73	35.75	−0.94***	−0.35
	(0.13)	(0.44)	(0.20)	(35.62)	(35.60)	(0.24)	(0.27)
part_time	−0.67***	−0.11	−0.92***	2.40	2.64	−0.94***	0.19
	(0.13)	(0.45)	(0.20)	(36.17)	(36.14)	(0.25)	(0.28)
retired	−1.33***	−0.63	−1.14***	−8.71	−9.17	−1.46***	−1.04***
	(0.14)	(0.48)	(0.22)	(38.68)	(38.65)	(0.27)	(0.30)
homemaker	−0.12	−0.24	−0.30	11.78	12.52	−0.73*	1.13***
	(0.19)	(0.69)	(0.31)	(55.81)	(55.79)	(0.38)	(0.43)
unemployed	0.87***	1.22*	0.68**	5.66	7.30	0.57	−0.53
	(0.21)	(0.73)	(0.33)	(59.09)	(59.09)	(0.41)	(0.45)
Constant	8.30***	5.50***	7.16***	23.87	25.06	9.87***	4.40***
	(0.41)	(1.42)	(0.64)	(115.45)	(115.41)	(0.79)	(0.89)
Δ female		2.28***	0.45***	27.71	28.05	-0.30*	2.29***
		(0.27)	(0.14)	(20.78)	(20.77)	(0.16)	(0.18)
Observations	115,981	100,649	100,731	100,679	100,729	100,723	100,613
R^2	0.03	0.004	0.01	0.01	0.01	0.01	0.01

*p<0.1; **p<0.05; ***p<0.01
Standard errors in parentheses.

Notes: Table 9 compares the regression coefficients of a pooled OLS estimation of individual inflation expectations (12 months ahead, point estimate) for the overall index to that of several sub-components, namely gas, food, costs of college education, medical costs, rent and gold on the dummy variable female and other demographics in the SCE. All models include regional controls and time fixed effects. The bottom line computes the difference between the female coefficient for the full basket and for the six sub-categories.

Sources: Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; own calculations

is unresponsive to changes in inflation expectations. Somewhat counterintuitively, Candia et al. (2020) even find that higher expectations may be associated with lower spending, opposite of what the Euler equation would predict. In recent work Coibion et al. (2024) show how higher uncertainty reduces spending. Since uncertainty is connected to higher expectations as shown above, this may be an important channel. I show that women's higher inflation expectations can be linked to higher uncertainty (as both are driven by the same factors); these may explain the lower spending intention of women.

Using a question in the BOP-HH that elicits the intent to spend on different items, I test how much the gender gap in inflation expectations contributes to the gender gap in spending intentions. I choose to focus on major items, essential items and entertainment as a luxury item. I run a pooled OLS regression with the intent to spend on the left-hand side (measured on a scale from -1 to 1) and inflation expectations and demographics on the right-hand side and find that indeed, higher inflation expectations are connected to lower spending intentions for all items. However, women have no lower probability to spend once inflation expectations are controlled for when it comes to major items and entertainment. This suggests that the gender gap in inflation expectations is at least partially a driver of women's lower planned spending. The regression results can be found in Table 10.

To quantify how much of the gender gap in spending can be attributed to the gap in expectations, I run a single mediator model (MacKinnon, 2012; Tingley et al., 2014). Figure 5 shows that for major items about 30% of the gap in spending can be attributed to women's higher inflation expectations and for a luxury item such as entertainment even up to 60%.

Result 6.1 *The gender gap in spending intentions can be attributed largely to the gender gap in inflation expectations.*

7 Conclusion

This paper contributes both theoretically and empirically to the literature on inflation expectations. Theoretically, I argue that heterogeneity in observed point forecasts and forecast confidence can stem from noise in priors and received signals. Specifically, assuming a log-normal prior distribution, adjusting noise volatility can heighten average inflation expectations, aligning with the established experience hypothesis in literature (D'Acunto, Malmendier, & Weber, 2021; Jonung, 1981). However, this channel will only work when priors are sufficiently flat. Symmetrically, low forecast confidence measured through flat priors can have the same effect when environments are noisy.

Table 10: Effect of the gender gap in inflation expectations on spending

	Major items		Essential items		Entertainment	
	(1)	(2)	(3)	(4)	(5)	(6)
inflexp	−0.01***	−0.01***	−0.001***	−0.001***	−0.01***	−0.01***
	(0.0003)	(0.001)	(0.0002)	(0.0003)	(0.0003)	(0.0005)
female	−0.01	−0.01**	−0.02***	−0.02***	0.003	−0.02***
	(0.005)	(0.01)	(0.003)	(0.003)	(0.004)	(0.01)
inflexp x female		0.001**		−0.0003		0.003***
		(0.001)		(0.0004)		(0.001)
age	−0.004***	−0.004***	−0.001***	−0.001***	−0.003***	−0.003***
	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0002)
educ	0.01***	0.01***	0.004***	0.004***	0.02***	0.02***
	(0.001)	(0.001)	(0.0004)	(0.0004)	(0.001)	(0.001)
hhinc	0.03***	0.03***	0.01***	0.01***	0.03***	0.03***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
full_time	−0.02**	−0.02**	0.002	0.002	−0.03***	−0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
part_time	−0.004	−0.004	0.004	0.004	−0.01	−0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
retired	0.02	0.02	0.03***	0.03***	0.05***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
homemaker	−0.05***	−0.05***	−0.02*	−0.02*	−0.05***	−0.05***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
unemployed	−0.07***	−0.07***	−0.03**	−0.03**	−0.05***	−0.05***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
refresher	−0.01**	−0.01**	0.02***	0.02***	−0.04***	−0.04***
	(0.01)	(0.01)	(0.003)	(0.003)	(0.01)	(0.01)
Constant	−0.28***	−0.28***	−0.04**	−0.04**	−0.10***	−0.09***
	(0.03)	(0.03)	(0.01)	(0.01)	(0.02)	(0.02)
Observations	105,035	105,035	105,035	105,035	105,035	105,035
R^2	0.05	0.05	0.02	0.02	0.14	0.14

*p<0.1; **p<0.05; ***p<0.01
Standard errors in parentheses.

Notes: Coefficients from a linear regression of spending intention (scale -1 to 1) on specific items in the BOP-HH. All regressions incorporate regional controls and time fixed effects.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; own calculations

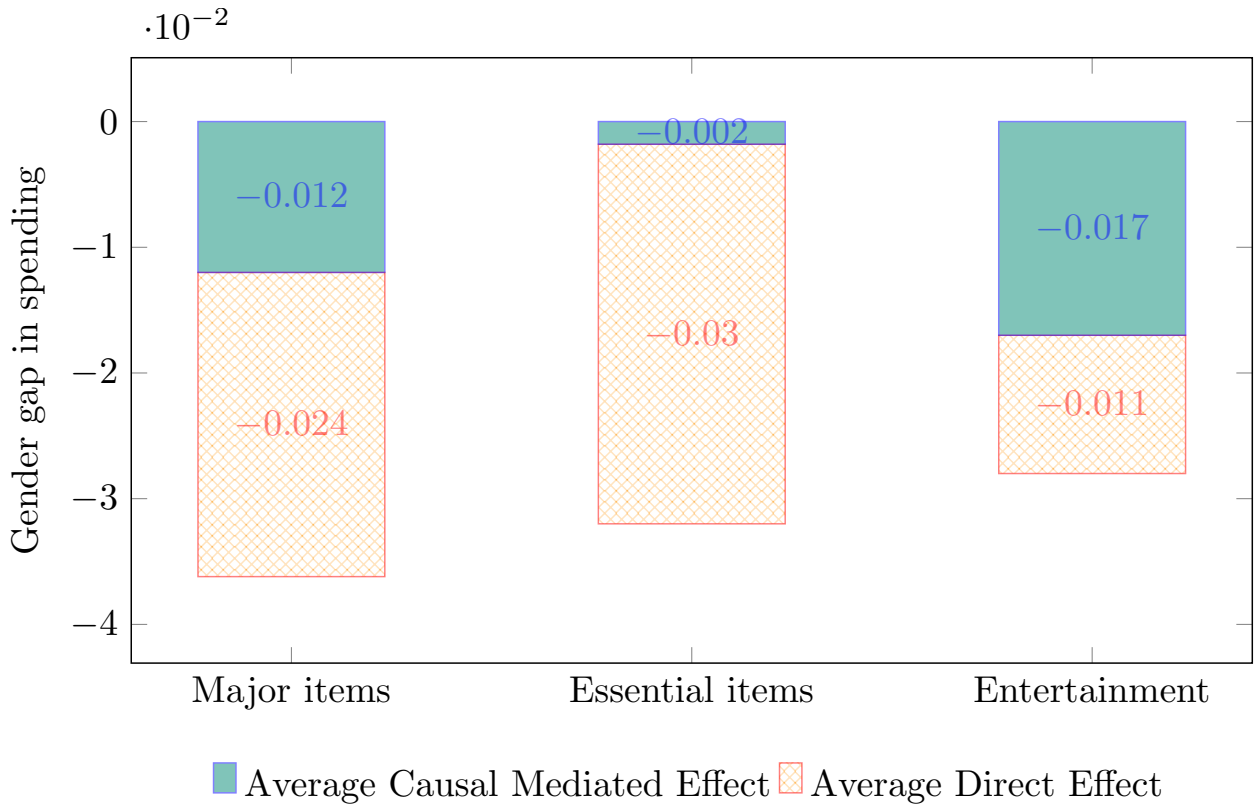


Figure 5: Decomposition of the gender gap in spending intention

Notes: Decomposition of the gender gap in spending on a given item into a direct effect and an effect mediated by women's higher inflation expectations.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; own calculations

Empirically, in data from German households, I find that grocery shopping alone inadequately explains inflation expectations. I highlight the importance of another channel: forecast confidence. This can be measured through rounding of point forecasts (C. C. Binder, 2017; Reiche & Meyler, 2022). I compute the probability to round using rounding behavior in other survey questions. If women and men had the same forecasting confidence, the gender gap would in fact be negative. Grocery shopping elevates expectations among those with low confidence but does nothing to those with high confidence. I find that confidence is linked largely to financial literacy, known to differ substantially between men and women (Bucher-Koenen et al., 2017; Bucher-Koenen et al., 2024). My findings thus demonstrate the gender gap as a composite of traditional gender norms and women's lower financial literacy and thus lower confidence. This finding is important for the literature on inflation expectations beyond the gender gap: Low confidence causes an upward bias through rounding in periods of moderate low inflation (choosing "5" overestimates 2-3% inflation), but the bias may in fact be downwards in high inflation periods ("5" underestimates 8% inflation). Thus, survey expectations may appear more anchored in high inflation periods. This may explain why Hajdini et al. (2024) do not find a positive gender gap in a new survey of indirect inflation expectations conducted during the recent inflation surge.

While the German data is collected during a period of increasing inflation, which can affect the attention consumers pay to inflation (Pfäuti, 2023; Weber et al., forthcoming), I provide robustness checks using US data from the SCE and the MSC. I confirm the mechanism hypothesized by the framework, namely that higher point forecasts arise as a consequence of higher uncertainty of a right-skewed posterior. Trimming the distributions of expectations reduces the gender gap significantly, demonstrating that the gap is driven by the right tail as suggested by the model. Contrary to implications from the standard experience hypothesis, my robustness checks also reveal that the gender gap does not vanish among singles, doe not heighten during periods of high food price inflation and is larger when asked about the general basket than specifically about food prices. The evidence suggests that the pure experience hypothesis is not enough to explain the gender gap in inflation expectations. Confidence emerges as pivotal, with grocery shopping heightening expectations solely within the bottom 11% of the confidence distribution, aligning with the framework's predictions.

However, the fact that the gender gap appears to be driven largely by low confidence has policy implications. While many women have similar expectations to those of men and appear equally financially literate, there exists a large upper tail of women with low confidence. This translates into rounded and less precise estimates and matters for female investment and saving behavior. Lusardi and Mitchell (2008) show that women often under-

save for retirement, which is worsened by the fact that many reach an older age than male spouses. Expecting higher levels of inflation due to lower confidence rationalizes this result. Further, lower literacy may lead to lower perceptibly to policy communicated in expert language. If women pay less attention or are less likely to draw the correct conclusions from policy messages due to low levels of financial literacy in the tails and trust in own abilities, they will not adjust behavior as expected. As a consequence, McMahon and Reiche (2025) suggest that central banks should diversify their communication to address those gaps. A promising channel may be to increase the representation of women in policy institutions which has been linked to better outreach (D'Acunto, Fuster, & Weber, 2022).

There could be additional channels to explain the gender gap in inflation expectations. Economic pessimism, defined by Hey (1984) as skewing expectations towards unfavorable outcomes, could influence inflation expectations. Although studies suggest women may exhibit greater pessimism in various contexts,[13] evidence specific to inflation is lacking. A simple t-test in the BOP-HH indicates no significant difference in general mood between men (mean = 2.12) and women (mean = 2.14, scale 1–4, p-value = 0.0544). Additionally, recent research (Garriga, 2023) suggests women may express less satisfaction with the Bank of England's work, potentially influencing their perception of inflation negatively. Future studies could also explore the concept of "pinkflation", where products predominantly purchased by women might experience higher inflation rates compared to those purchased by men. Research in this area is currently limited, and scanner data could provide insights into these questions.

References

Abildgren, K., & Kuchler, A. (2021). Revisiting the inflation perception conundrum. *Journal of Macroeconomics*, *67*. https://doi.org/10.1016/j.jmacro.2020.103264

Arioli, R., Lim, Y. C., Sek, S. K., Easaw, J., Golinelli, R., Malgarini, M., Morvan, C., Jenkins, B., Carroll, C. D., Axtell, R., Branch, W., Christ, C., Dickens, W., Dotsey, M., Epstein, J., Goodfriend, M., Manning, J., Mccallum, B., Mehra, Y., ... Schulhofer-Wohl, S. (2017). EU Consumers' Quantitative Inflation Perceptions and Expectations: an Evaluation. *Occasional Paper Series, European Central Bank*, *91*(186). Retrieved September 23, 2024, from https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op186.en.pdf?c58df51446c7605dd5f939bcc7cd35b3

[13] Jacobsen et al. (2014) on consumer sentiment and stock market performance, Chaney et al. (1998) on election outcomes, Garbarino and Strahilevitz (2004) on online shopping, Lin and Raghubir (2005) on marriage, Lyons et al. (2009) on health and Gwartney-Gibbs and Lach (2016) on war

Armantier, O., Bruine De Bruin, W., Potter, S., Topa, G., Van Der Klaauw, W., & Zafar, B. (2013). Measuring inflation expectations. *Annual Review of Economics*, *5*, 273–301. https://doi.org/10.1146/annurev-economics-081512-141510

Armantier, O., Nelson, S., Topa, G., van der Klaauw, W., & Zafar, B. (2016). The price is right: Updating inflation expectations in arandomized price information experiment. *Review of Economics and Statistics*, *98*(3), 503–523. https://doi.org/10.1162/REST{_}a{_}00499

Armantier, O., Topa, G., van der Klaauw, W., & Zafar, B. (2017). An Overview of the Survey of Consumer Expectations. *FRBNY Economic Policy Review*, *23*(2), 51–72.

Bachmann, R., Berg, T. O., & Sims, E. R. (2015). Inflation Expectations and Readiness to Spend: Cross-Sectional Evidence. *American Economic Journal: Economic Policy*, *7*(1), 1–35. https://doi.org/10.1257/pol.20130292

Binder, C. (2017). Fed speak on main street: Central bank communication and household expectations. *Journal of Macroeconomics*, *52*, 238–251. https://doi.org/10.1016/J.JMACRO.2017.05.003

Binder, C. C. (2017). Measuring uncertainty based on rounding: New method and application to inflation expectations. *Journal of Monetary Economics*, *90*. https://doi.org/10.1016/j.jmoneco.2017.06.001

Blanchflower, D., & MacCoille, C. (2009). The formation of inflation expectations: an empirical analysis for the UK. *NBER Working Paper*. https://doi.org/10.3386/w15388

Blinder, A. S. (1973). Wage discrimination: Reduced form and structural estimates. *The Journal of Human Resources*, *8*, 436. https://doi.org/10.2307/144855

Brischetto, A., & de Brouwer, G. (1999). Householders' Inflation Expectations. *RBA Research Discussion Paper*. Retrieved September 23, 2024, from https://catalogue.nla.gov.au/Record/1434103/Details

Bruine De Bruin, W., Van der Klaauw, W., Downs, J. S., Fischhoff, B., Topa, G., Armantier, O., Chien, S., Colvin, T., Forman, D., Fielding, P., Greenwald, D., Gutsche, T., Holbrook, M., & Weerman, B. (2010). Expectations of Inflation: The Role of Demographic Variables, Expectation Formation, and Financial Literacy. *Journal of Consumer Affairs*, *44*(2), 381–402. https://doi.org/10.1111/J.1745-6606.2010.01174.X

Bryan, M., & Venkatu, G. (2001). The Curiously Different Inflation Perspectives of Men and Women. *Economic Commentary*, (November 2001). Retrieved September 23, 2024, from https://www.clevelandfed.org/newsroom-and-events/publications/economic-commentary/economic-commentary-archives/2001-economic-commentaries/ec-20011101-the-curiously-different-inflation-perspectives-of-men-and-women

Bucher-Koenen, T., Alessie, R. J., Lusardi, A., & Rooij, M. v. (2024). Fearless Woman: Financial Literacy and Stock Market Participation. *Management Science*, *forthcoming*. https://doi.org/10.1287/mnsc.2023.00425

Bucher-Koenen, T., Lusardi, A., Alessie, R., & van Rooij, M. (2017). How financially literate are women? an overview and new insights. *Journal of Consumer Affairs*, *51*, 255–283. https://doi.org/10.1111/joca.12121

Burke, M. A., & Manz, M. (2014). Economic Literacy and Inflation Expectations: Evidence from a Laboratory Experiment. *Source: Journal of Money, Credit and Banking*, *46*(7), 1421–1456. https://doi.org/10.1111/jmcb.12144

Candia, B., Coibion, O., & Gorodnichenko, Y. (2020, September). *Communication and the Beliefs of Economic Agents*. https://doi.org/10.3386/w27800

Cavallo, A., Cruces, G., & Perez-Truglia, R. (2017). Inflation Expectations, Learning, and Supermarket Prices: Evidence from Survey Experiments. *American Economic Journal: Macroeconomics*, *9*(3), 1–35. https://doi.org/10.1257/MAC.20150147

Chaney, C. K., Alvarez, R. M., & Nagler, J. (1998). Explaining the gender gap in U.S. presidential elections, 1980-1992. *Political Research Quarterly*, *51*(2), 311–339. https://doi.org/10.1177/106591299805100202

Coibion, O., Georgarakos, D., Gorodnichenko, Y., Kenny, G., & Weber, M. (2024). The Effect of Macroeconomic Uncertainty on Household Spending. *American Economic Review*, *114*(3), 645–677. https://doi.org/10.1257/aer.20221167

Coibion, O., Georgarakos, D., Gorodnichenko, Y., & van Rooij, M. (2023). How Does Consumption Respond to News about Inflation? Field Evidence from a Randomized Control Trial. *American Economic Journal: Macroeconomics*, *15*(3), 109–152. https://doi.org/10.1257/mac.20200445

Coibion, O., Georgarakos, D., Gorodnichenko, Y., & Weber, M. (2023). Forward Guidance and Household Expectations. *Journal of the European Economic Association*, *21*(5), 2131–2171. https://doi.org/10.1093/jeea/jvad003

Coibion, O., Gorodnichenko, Y., Knotek, E. S., & Schoenle, R. (2023). Average Inflation Targeting and Household Expectations. *Journal of Political Economy Macroeconomics*, *1*(2), 403–446. https://doi.org/10.1086/722962

Coibion, O., Gorodnichenko, Y., Kumar, S., & Pedemonte, M. (2020). Inflation expectations as a policy tool? *Journal of International Economics*, *124*, 103297. https://doi.org/10.1016/J.JINTECO.2020.103297

Coibion, O., Gorodnichenko, Y., & Weber, M. (2022). Monetary Policy Communications and their Effects on Household Inflation Expectations. *Journal of Political Economy*, *130*(6), 1537–1584. https://doi.org/https://doi.org/10.1086/718982

Corduas, M. (2022). Gender differences in the perception of inflation. *Journal of Economic Psychology*, *90*, 102522. https://doi.org/10.1016/J.JOEP.2022.102522

D'Acunto, F., Charalambakis, E., Geogarakos, D., Kenny, G., Meyer, J., & Weber, M. (2024). Household inflation expectations: an overview of recent insights for monetary policy. *ECB Discussion Paper*, (24). Retrieved September 23, 2024, from https://www.ecb.europa.eu/pub/pdf/scpdps/ecb.dp24~9b349a69b7.en.pdf

D'Acunto, F., Fuster, A., & Weber, M. (2022). Diverse Policy Committees Can Reach Underrepresented Groups. *NBER Working Paper*, (29275). https://doi.org/10.3386/w29275

D'Acunto, F., Hoang, D., Paloviita, M., & Weber, M. (2019). Cognitive Abilities and Inflation Expectations. *AEA Papers and Proceedings*, *109*, 562–66. https://doi.org/10.1257/PANDP.20191050

D'Acunto, F., Hoang, D., Paloviita, M., & Weber, M. (2022). IQ, Expectations, and Choice. *The Review of Economic Studies*, *90*(5), 2292–2325. https://doi.org/10.1093/restud/rdac075

D'Acunto, F., Malmendier, U., Ospina, J., & Weber, M. (2021). Exposure to grocery prices and inflation expectations. *Journal of Political Economy*, *129*(5), 1615–1639. https://doi.org/10.1086/713192

D'Acunto, F., Malmendier, U., & Weber, M. (2021). Gender Roles produce divergent economic expectations. *Proceedings of the National Academy of Science*, *118*(21). https://doi.org/10.1073/pnas.2008534118

D'Acunto, F., & Weber, M. (2024). Why Survey-Based Subjective Expectations are Meaningful and Important. *Annual Reveiw of Economics*, *16*(1), 329–357. https://doi.org/10.1146/annurev-economics-091523-043659

Del Giovane, P., Fabiani, S., & Sabbatini, R. (2008). What's behind "inflation perceptions"? A survey-based analysis of Italian consumers. In *The euro, inflation and consumer's perceptions* (pp. 157–197). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-540-78370-1{_}7

Di Tella, R., MacCulloch, R. J., & Oswald, A. J. (2001). Preferences over inflation and unemployment: Evidence from surveys of happiness. *American Economic Review*, *91*(1), 335–347. https://doi.org/10.1257/aer.91.1.335

Dräger, L., Menz, J. O., & Fritsche, U. (2014). Perceived inflation under loss aversion. *Applied Economics*, *46*(3), 282–293. https://doi.org/10.1080/00036846.2013.844328

Dräger, L., & Nghiem, G. (2020). Are Consumers' Spending Decisions in Line with an Euler Equation? *The Review of Economics and Statistics*, *103*(3), 580–596. https://doi.org/10.1162/rest{_}a{_}00909

Engelberg, J., Manski, C. F., & Williams, J. (2009). Comparing the Point Predictions and Subjective Probability Distributions of Professional Forecasters. *Journal of Business & Economic Statistics*, *27*(1), 30–41. https://doi.org/10.1198/jbes.2009.0003

Federal Reserve Bank of New York. (2020). Survey of Consumer Expectations. Retrieved September 23, 2024, from http://www.newyorkfed.org/microeconomics/sce

Garbarino, E., & Strahilevitz, M. (2004). Gender differences in the perceived risk of buying online and the effects of receiving a site recommendation. *Journal of Business Research*, *57*(7), 768–775. https://doi.org/10.1016/S0148-2963(02)00363-6

Garriga, A. C. (2023). Box A: Public Confidence in the Bank of England. *National Institute UK Economic Outlook*.

Gorodnichenko, Y., & Sergeyev, D. (n.d.). *Zero Lower Bound on Inflation Expectations*, NBER. https://www.nber.org/papers/w29496

Gwartney-Gibbs, P. A., & Lach, D. H. (2016). Sex Differences in Attitudes toward Nuclear War: *Journal of Peace Research*, *28*(2), 161–174. https://doi.org/10.1177/0022343391028002003

Hajdini, I., Knotek, E. S., Leer, J., Pedemonte, M., Rich, R., & Schoenle, R. (2024). Indirect consumer inflation expectations: Theory and evidence. *Journal of Monetary Economics*, *145*, 103568. https://doi.org/10.1016/j.jmoneco.2024.103568

Hey, J. D. (1984). The Economics of Optimism and Pessimism. *Kyklos*, *37*(2), 181–205. https://doi.org/10.1111/J.1467-6435.1984.TB00748.X

Jacobsen, B., Lee, J. B., Marquering, W., & Zhang, C. Y. (2014). Gender differences in optimism and asset allocation. *Journal of Economic Behavior & Organization*, *107*, 630–651. https://doi.org/10.1016/J.JEBO.2014.03.007

Jonung, L. (1981). Perceived and Expected Rates of Inflation in Sweden. *American Economic Review*, *71*(5), 961–968. https://www.jstor.org/stable/1803477

Krifka, M. (2007). Approximate Interpretations of Number Words: A case for strategic communication. *Proceedings of the Colloquium, Amsterdam, 27–28 October 2004*. https://semantics.uchicago.edu/kennedy/classes/s09/experimentalsemantics/krifka07.pdf

Lamla, M. J., & Vinogradov, D. V. (2019). Central bank announcements: Big news for little people? *Journal of Monetary Economics*, *108*, 21–38. https://doi.org/10.1016/J.JMONECO.2019.08.014

Leung, C. (2009). The demographics of household inflation perceptions and expectations. *Reserve Bank of New Zealand Bulletin*, *72*(2), 34–42. Retrieved September 23, 2024, from https://www.rbnz.govt.nz/-/media/project/sites/rbnz/files/publications/bulletins/2009/2009jun72-2leung.pdf

Lin, Y. C., & Raghubir, P. (2005). Gender differences in unrealistic optimism about marriage and divorce: Are men more optimistic and women more realistic? *Personality and Social Psychology Bulletin*, *31*(2), 198–207. https://doi.org/10.1177/0146167204271325

Lusardi, A., & Mitchell, O. S. (2008). Planning and Financial Literacy: How Do Women Fare? *American Economic Review*, *98*(2), 413–417. https://doi.org/10.1257/aer.98.2.413

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, *52*(1). https://doi.org/10.1257/jel.52.1.5

Lyons, K. S., Stewart, B. J., Archbold, P. G., & Carter, J. H. (2009). Optimism, Pessimism, Mutuality, and Gender: Predicting 10-Year Role Strain in Parkinson's Disease Spouses. *The Gerontologist*, *49*(3), 378–387. https://doi.org/10.1093/GERONT/GNP046

MacKinnon, D. P. (2012, October). *Introduction to statistical mediation analysis*. Routledge. https://doi.org/10.4324/9780203809556

Malmendier, U., & Nagel, S. (2016). Learning from Inflation Experiences. *The Quarterly Journal of Economics*, *131*(1), 53–87. https://doi.org/10.1093/QJE/QJV037

McMahon, M., & Reiche, L. (2025). Does the Bank of England need Gendered Communication. *National Institute Economci Review*, *forthcoming*.

Oaxaca, R. (1973). Male-female wage differentials in urban labor markets. *International Economic Review*, *14*, 693. https://doi.org/10.2307/2525981

Palmqvist, S., & Strömberg, L. (2004). Households' inflation opinions - a tale of two surveys. *Economic Review*, (4), 23–42. Retrieved September 23, 2024, from https://archive.riksbank.se/Upload/Dokument_riksbank/Kat_publicerat/Artiklar_PV/ER04_2.pdf

Pfajfar, D., & Santoro, E. (2010). Heterogeneity, learning and information stickiness in inflation expectations. *Journal of Economic Behavior & Organization*, *75*(3), 426–444. https://doi.org/10.1016/j.jebo.2010.05.012

Pfäuti, O. (2023, August). *The Inflation Attention Threshold and Inflation Surges*.

Reiche, L., & Meyler, A. (2022). Making Sense of Consumer Inflation Expectations. *ECB Working Papers*, (2642). Retrieved September 23, 2024, from https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2642~f96823e5de.en.pdf?a6b9965facced0d1ecc25de9a5a4f94d

Research Data and Service Centre. (2022, October). Bundesbank-Online-Panel-Households (BOP-HH). https://doi.org/https://doi.org/10.12757/Bbk.BOPHH.202204.01

Silverstein, M. J., & Sayre, K. (2009). The Female Economy. *Harvard Business Review*. Retrieved September 23, 2024, from https://hbr.org/2009/09/the-female-economy

Survey Research Center. (2023). University of Michigan Surveys of Consumers. Retrieved September 23, 2024, from https://sda.umsurvey.org/

Tingley, D., Yamamoto, T., Hirose, K., Keele, L., & Imai, K. (2014). Mediation: R package for causal mediation analysis. *Journal of Statistical Software*, *59*. https://doi.org/10.18637/jss.v059.i05

Vellekoop, N., & Wiederholt, M. (2019). Inflation Expectations and Choices of Households. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3383452

Weber, M., Candia, B., Ropele, T., Lluberas, R., Frache, S., Meyer, B., Kumar, S., Gorodnichenko, Y., Georgarakos, D., Coibion, O., Kenny, G., & Ponce, J. (forthcoming). Tell Me Something I Don't Already Know: Learning in Low and High-Inflation Settings. *Econometrica*.

Weber, M., D'Acunto, F., Gorodnichenko, Y., & Coibion, O. (2022). The Subjective Inflation Expectations of Households and Firms: Measurement, Determinants, and Implications. *Journal of Economic Perspectives*, *36*(3), 157–184. https://doi.org/10.1257/jep.36.3.157

A Additional Material for Bayesian Framework

Algebraic manipulations to derive the log-normal posterior

The prior is defined as

$$\log\theta \sim \mathcal{N}\left(\mu_0, \frac{1}{\tau_0}\right),$$
$$p(\theta) = \frac{\sqrt{\tau_0}}{\theta\sqrt{2\pi}} \exp\left(-\frac{\tau_0(\log\theta - \mu_0)^2}{2}\right).$$

The unbiased signal is defined as

$$\log x = \log\theta + \epsilon,$$
$$\text{where } \epsilon \sim \mathcal{N}\left(0, \frac{1}{\tau_x}\right),$$
$$p(x|\theta) = \frac{\sqrt{\tau_x}}{x\sqrt{2\pi}} \exp\left(-\frac{\tau_x(\log x - \log\theta)^2}{2}\right)$$

I compute the posterior following Bayesian updating:

$$\begin{aligned}
&p(\theta|x) \propto p(\theta)p(x|\theta) \\
&= \frac{\sqrt{\tau_0}}{\theta\sqrt{2\pi}} \exp\left(-\frac{\tau_0(\log\theta - \mu_0)^2}{2}\right) \frac{\sqrt{\tau_x}}{x\sqrt{2\pi}} \exp\left(-\frac{\tau_x(\log x - \log\theta)^2}{2}\right) \\
&= \frac{\sqrt{\tau_0}\sqrt{\tau_x}}{\theta x 2\pi} \exp\left(-\frac{1}{2}\left[\tau_0\left((\log\theta)^2 - 2\mu_0\log\theta + \mu_0^2\right)\right.\right. \\
&\left.\left. + \tau_x\left((\log x)^2 - 2\log x\log\theta) + (\log\theta)^2\right)\right]\right) \\
&\propto \frac{1}{\theta} \exp\left(-\frac{1}{2}\left[(\tau_0+\tau_x)(\log\theta)^2 - 2(\tau_0\mu_0 + \tau_x\log x)\log\theta\right]\right).
\end{aligned}$$

That this is proportional to a log-normal distribution,

$$p(\theta|x) \propto \frac{1}{\theta} \exp\left(-\frac{\hat{\tau}(\log\theta - \hat{\mu})^2}{2}\right),$$

where

$$\hat{\mu} = \frac{\mu_0\tau_0 + \tau_x\log x}{\tau_x + \tau_0},$$
$$\text{and } \hat{\tau} = \tau_0 + \tau_x.$$

Comparative statics

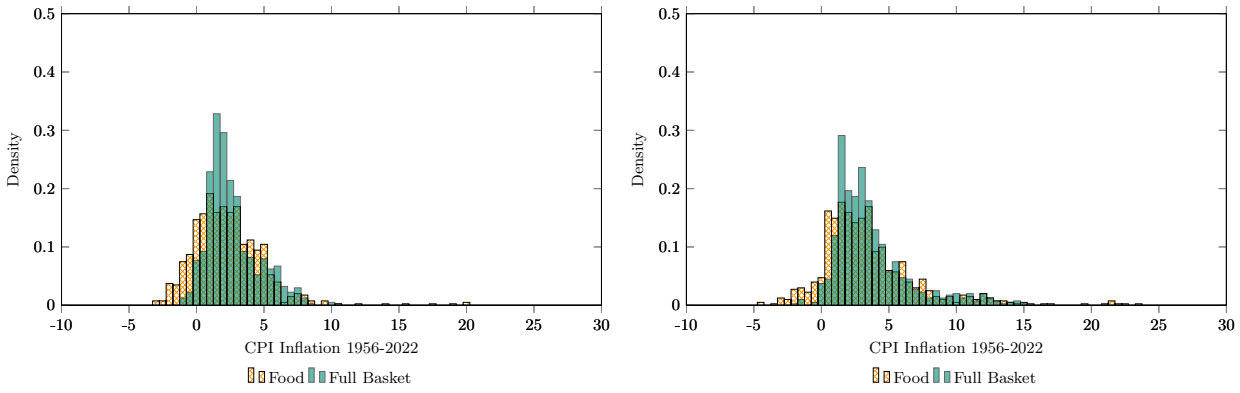
The effect of increasing signal volatility

$$\begin{aligned}
\mathrm{E}(\theta|x) &= \exp\left(\hat{\mu} + \frac{1}{2\hat{\tau}}\right) \\
&= \exp\left(\frac{\tau_0\mu_0 + \tau_x \log x + \frac{1}{2}}{\tau_x + \tau_0}\right) \\
\frac{d\mathrm{E}(\theta|x)}{d\tau_x} &= \left(\frac{2\tau_0(\log x - \mu_0) - 1}{2(\tau_x + \tau_0)^2}\right) \times \mathrm{E}(\theta|x) \\
&< 0 \text{ whenever } 2\tau_0(\log x - \mu_0) - 1 < 0 \Rightarrow \log x - \mu_0 < \frac{1}{2\tau_0}
\end{aligned}$$

The effect of decreasing prior precision

$$\begin{aligned}
\mathrm{E}(\theta|x) &= \exp\left(\hat{\mu} + \frac{1}{2\hat{\tau}}\right) \\
&= \exp\left(\tau_0\frac{\mu_0 + \tau_x \log x + \frac{1}{2}}{\tau_x + \tau_0}\right) \\
\frac{d\mathrm{E}(\theta|x)}{d\tau_0} &= \left(\frac{2\tau_x(\mu_0 - \log x) - 1}{2(\tau_x + \tau_0)^2}\right) \times \mathrm{E}(\theta|x) \\
&> 0 \text{ whenever } 2\tau_x(\mu_0 - \log x) - 1 < 0 \Rightarrow \mu_0 - \log x < \frac{1}{2\tau_x}
\end{aligned}$$

B Distribution of Food Prices



(a) Germany (b) United States

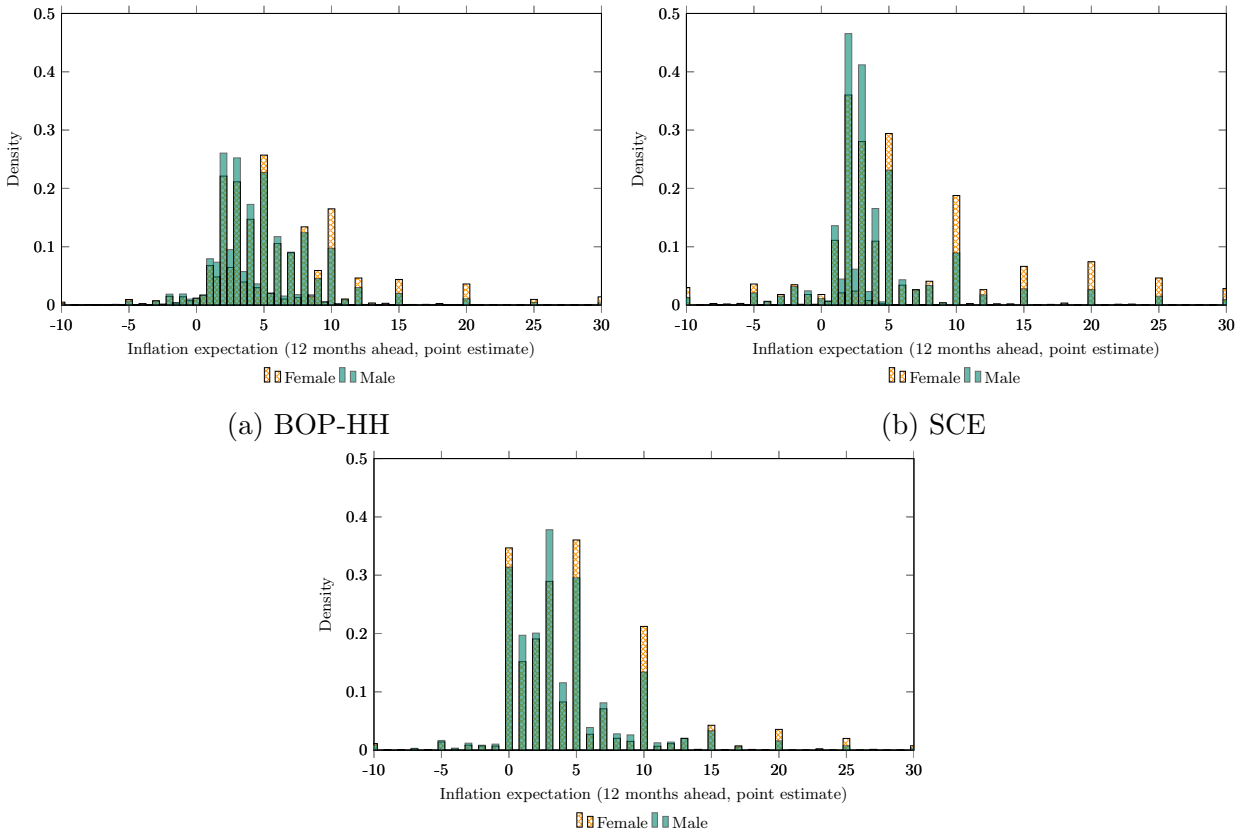
Figure B.1: Histogram of CPI Inflation

Sources: OECD, Prices: Consumer prices, Main Economic Indicators (database), January 1956 - December 2022; own calculations

C The Role of Demographics

I verify that the gender gap in inflation expectations cannot be explained by standard demographic variables such as age, income and education, which may be distributed differently for men and women. To do so, Table 11 shows their interaction effects with female. For realistic values of age, income and education, despite a negative correlation with female, the gap persists.

D Distribution of Expectations



(a) BOP-HH

(b) SCE

(c) MSC

Figure D.1: Histogram of inflation expectation point forecasts of men and women

Notes: Distribution of male and female inflation expectations (measured as point forecasts over 12 months) pooled across all time periods. There is one plot per survey. The figures show that the distribution is more right skewed for women and rounded numbers (i.e. multiples of 5 or 10) are chosen more frequently.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; University of Michigan, Survey Research Center, MSC, January 1978 - January 2023; own calculations

Table 11: The gender gap and demographic controls

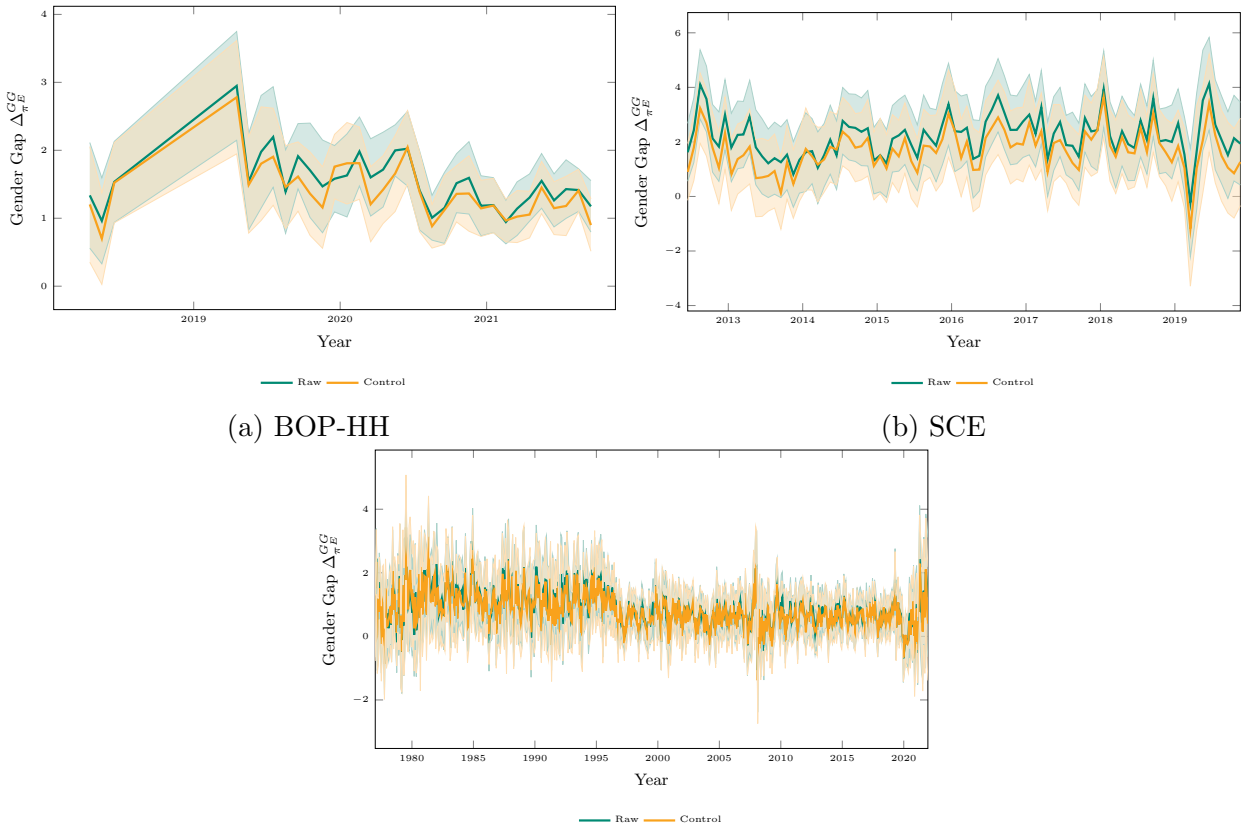
	Inflation expectation (12 months ahead, point estimate)					
	BOP-HH		SCE		MSC	
	(1)	(2)	(3)	(4)	(5)	(6)
female	1.32***	4.60***	1.69***	3.68***	0.86***	3.17***
	(0.04)	(0.25)	(0.07)	(0.38)	(0.02)	(0.10)
age	−0.01***	−0.003	0.03***	0.03***	−0.02***	−0.01***
	(0.002)	(0.002)	(0.003)	(0.004)	(0.001)	(0.001)
female x age		−0.02***		0.002		−0.02***
		(0.003)		(0.005)		(0.001)
hhinc	−0.21***	−0.15***	−0.40***	−0.35***	−0.0000***	−0.0000***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.0000)	(0.0000)
female x hhinc		−0.16***		−0.11***		−0.0000***
		(0.02)		(0.03)		(0.0000)
educ	−0.12***	−0.08***	−0.47***	−0.31***	−0.24***	−0.10***
	(0.01)	(0.01)	(0.03)	(0.03)	(0.01)	(0.01)
female x educ		−0.12***		−0.34***		−0.30***
		(0.01)		(0.05)		(0.02)
single	−0.50***	−0.29***	−0.09	−0.29**	−0.004	−0.04
	(0.06)	(0.07)	(0.09)	(0.12)	(0.03)	(0.04)
female x single		−0.47***		0.34**		0.08
		(0.11)		(0.17)		(0.05)
full_time	0.25***	0.31***	−0.41***	−0.41***		
	(0.09)	(0.09)	(0.13)	(0.13)		
part_time	0.16	0.18*	−0.67***	−0.66***		
	(0.10)	(0.10)	(0.13)	(0.13)		
retired	−0.13	−0.11	−1.33***	−1.32***		
	(0.10)	(0.10)	(0.14)	(0.14)		
homemaker	0.57***	0.50***	−0.14	−0.16		
	(0.18)	(0.18)	(0.20)	(0.20)		
unemployed	1.10***	1.14***	0.88***	0.88***		
	(0.20)	(0.20)	(0.21)	(0.21)		
refresher	−0.20***	−0.22***	−1.84***	−1.84***		
	(0.05)	(0.05)	(0.11)	(0.11)		
Constant	5.28***	3.99***	8.34***	7.44***	7.30***	6.21***
	(0.25)	(0.27)	(0.42)	(0.46)	(0.26)	(0.26)
Observations	106,856	106,856	115,969	115,969	261,374	261,374
R^2	0.11	0.11	0.03	0.03	0.12	0.12

*p<0.1; **p<0.05; ***p<0.01
Standard errors in parentheses below.

Notes: Regression coefficients of a pooled OLS estimation of individual inflation expectations (12 months ahead, point estimate), on demographics and their interaction with female. All models include regional dummies and time fixed effects.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; University of Michigan, Survey Research Center, MSC, January 1978 - January 2023; own calculations

E Gender Gaps over Time



(a) BOP-HH

(b) SCE

(c) MSC

Figure E.1: The gender gap raw and controlled for demographics over time

Notes: Estimated regression coefficients for the dummy variable *female* with no controls (green line) and with all demographics controls available (yellow line). These include: age, income, education, unemployed, retired, full-time work, part-time work, homemaker, region controls, and household size.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; University of Michigan, Survey Research Center, MSC, January 1978 - January 2023; own calculations

F Estimation of Uncertainty

I follow the method of Engelberg et al. (2009). In the simple case of the respondent using only one or two bins, I fit an isosceles triangle using the bin edges as the limits to the support. In the case of two bins, the outer bin edge of the bin with the lower mass is determined through the relative weight of the probability mass int hat bin. In contrast, I estimate an unimodal generalized beta distribution with two parameters for three or more bins. In the cumulative

distribution shown in Equation 17, l and r indicate the limits to the support taken directly from the bin edges.

$$Beta(t,a,b,l,r) = \left\{ \begin{array}{ll} 0 & \text{if} \quad t \leq l \\ \frac{1}{B(a,b)} \int_l^t \frac{(x-1)^{a-1}(r-x)^{b-1}}{(a-l)^{a-b-1}} dx & \text{if} \quad l < t \leq r \\ 1 & \text{if} \quad t \geq r \end{array} \right\} \tag{17}$$

$$\text{where} \quad B(a,b) = \frac{\Gamma(a)\Gamma(b)}{\Gamma(a+b)} \quad \text{and} \quad \Gamma(a) = \int_0^\infty x^{a-1}e^{-1}dx$$

I then estimate the shape parameters a and b, minimizing the sum of squared differences of the implied beta distribution and the probability mass allocated by the respondent, where the sum is taken over the right-hand edges of each bin (Equation 18).

$$\min_{a>1,b>1} \sum_{i=1}^{9} (Beta(t_i,a,b,l,r) - F(t_i))^2 \tag{18}$$

Since the last interval is unbounded to the right, I set open-ended intervals twice the width of the nearest closed intervals (here, 12-20%). This is in contrast to Engelberg et al. (2009) who estimate these on professional forecasters who rarely use extreme bins. Since households do more frequently, this adjustment is done to rescue these observations.

G Average Density Forecast

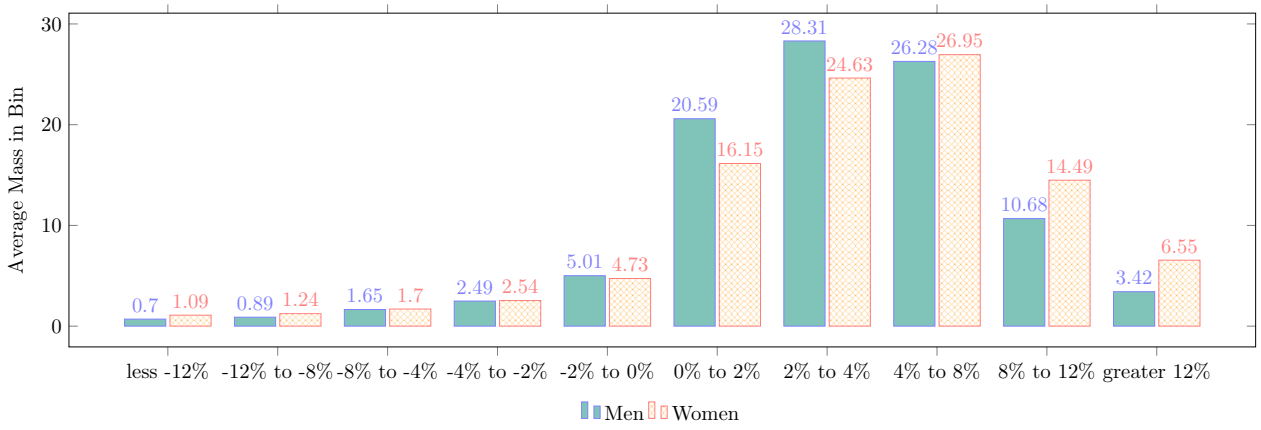


Figure G.1: Average density forecast of inflation 12 mohts ahead in the BOP-HH

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; own calculations

H Financial Literacy Questionnaire (SCE)

QnumIntro. Next, we would like to ask you five questions to see how people use numbers in everyday life. Please answer the following questions by filling in the blank.

QNUM2. Let's say you have $200 in a savings account. The account earns ten percent interest per year. Interest accrues at each anniversary of the account. If you never withdraw money or interest payments, how much will you have in the account at the end of two years?
$____
No answer

QNUM8. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, how much would you be able to buy with the money in this account?
1. More than today
2. Just as much as today
3. Less than today
No answer

QNUM9. Please tell me whether this statement is true or false: Buying a single company's stock usually provides a safer return than a stock mutual fund.
1. True
2. False
No answer

I Alternative Measures for Confidence and Experience

I test if the results in Table 4, 5 and Table 3 are robust to alternative measures of confidence and grocery shopping. For confidence, I include whether a respondent found the survey easy (1) or difficult (-1), interesting (1) or boring (-1) and a direct measure of rounding of the inflation forecast. For grocery shopping, I use being a single instead as singles are also assumed to participate in grocery shopping. The results can be found in Tables 12, 13 and 14.

Table 12: Confidence and Experience

	Inflation expectation (12 months ahead, point estimate)			
	(1)	(2)	(3)	(4)
female	1.22***	1.23***	0.94***	0.51***
	(0.06)	(0.06)	(0.06)	(0.07)
shop_groceries	0.13	0.14	−0.33***	
	(0.10)	(0.12)	(0.08)	
round_inflexppoint			2.80***	
			(0.11)	
round_inflexppoint:shop_groceries			1.84***	
			(0.16)	
qeasy	0.33**			
	(0.16)			
qeasy:shop_groceries	−0.15			
	(0.22)			
qinterest		0.21		
		(0.14)		
qinterest:shop_groceries		−0.12		
		(0.20)		
prob_confident				−11.68***
				(0.59)
single				−0.07
				(0.50)
prob_confident:single				−0.18
				(0.64)
age	−0.01***	−0.01***	−0.01***	−0.01**
	(0.003)	(0.003)	(0.003)	(0.003)
educ	−0.11***	−0.11***	−0.09***	−0.05***
	(0.01)	(0.01)	(0.01)	(0.01)
hhinc	−0.21***	−0.21***	−0.17***	−0.08***
	(0.01)	(0.01)	(0.01)	(0.02)
full_time	0.29***	0.30***	0.24**	−0.02
	(0.11)	(0.11)	(0.11)	(0.12)
part_time	0.21*	0.21*	0.19	0.01
	(0.13)	(0.13)	(0.12)	(0.14)
retired	−0.19	−0.19	−0.12	−0.11
	(0.13)	(0.13)	(0.13)	(0.14)
homemaker	0.95***	0.95***	0.78***	−0.22
	(0.24)	(0.24)	(0.23)	(0.25)
unemployed	2.15***	2.15***	1.97***	0.75***
	(0.28)	(0.28)	(0.28)	(0.27)
refresher	−0.22***	−0.22***	−0.14**	0.10
	(0.07)	(0.07)	(0.07)	(0.08)
Constant	5.79***	5.82***	4.66***	14.40***
	(0.40)	(0.41)	(0.39)	(0.53)
Observations	64,491	64,495	64,503	57,251
R^2	0.11	0.11	0.16	0.11

*p<0.1; **p<0.05; ***p<0.01

Standard errors in parentheses below.

Notes: Replication of Table 4 with alternative measures.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; own calculations

Table 13: Confidence and Experience

	Inflation expectation (12 months ahead, interquartile range)			
	(1)	(2)	(3)	(4)
female	0.22***	0.22***	0.17***	0.16***
	(0.02)	(0.02)	(0.02)	(0.03)
shop_groceries	−0.04	−0.004	−0.05*	
	(0.04)	(0.05)	(0.03)	
round_inflexppoint			0.67***	
			(0.05)	
round_inflexppoint x shop_groceries			0.26***	
			(0.06)	
qeasy	−0.22***			
	(0.06)			
qeasy x shop_groceries	0.13			
	(0.09)			
qinterest		−0.05		
		(0.06)		
qinterest x shop_groceries		0.02		
		(0.08)		
prob_confident				−1.79***
				(0.25)
single				−0.59***
				(0.22)
prob_confident x single				0.61**
				(0.28)
age	−0.02***	−0.02***	−0.02***	−0.02***
	(0.001)	(0.001)	(0.001)	(0.001)
educ	−0.04***	−0.04***	−0.04***	−0.04***
	(0.003)	(0.003)	(0.003)	(0.004)
hhinc	−0.10***	−0.10***	−0.09***	−0.08***
	(0.01)	(0.01)	(0.01)	(0.01)
full_time	−0.004	−0.001	−0.02	−0.03
	(0.04)	(0.04)	(0.04)	(0.05)
part_time	−0.02	−0.02	−0.03	−0.01
	(0.05)	(0.05)	(0.05)	(0.06)
retired	0.05	0.05	0.05	0.16**
	(0.05)	(0.05)	(0.05)	(0.06)
homemaker	0.35***	0.35***	0.32***	0.11
	(0.10)	(0.10)	(0.10)	(0.11)
unemployed	0.02	0.02	−0.02	0.07
	(0.11)	(0.11)	(0.11)	(0.12)
refresher	−0.34***	−0.34***	−0.32***	−0.19***
	(0.03)	(0.03)	(0.03)	(0.03)
Constant	5.30***	5.23***	4.94***	5.48***
	(0.16)	(0.16)	(0.16)	(0.23)
Observations	57,174	57,175	56,969	48,283
R^2	0.05	0.05	0.07	0.05

*p<0.1; **p<0.05; ***p<0.01

Standard errors in parentheses below.

Notes: Replication of Table 5 with alternative measures.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; own calculations

Table 14: Effect of confidence and grocery shopping on the gender gap

	Inflation expectation (12 months ahead, point estimate)								
	BOP-HH				SCE			MSC	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
female	1.33***	0.28***	1.40***	1.34***	1.44***	−0.02	1.48***	0.85***	0.04
	(0.05)	(0.06)	(0.08)	(0.07)	(0.09)	(0.10)	(0.10)	(0.03)	(0.04)
single	−0.49***				−0.45***			−0.04	
	(0.07)				(0.12)			(0.04)	
single:female	−0.01				0.69***			0.06	
	(0.10)				(0.15)			(0.05)	
round_inflexppoint		3.01***				4.86***			0.87***
		(0.07)				(0.12)			(0.04)
round_inflexppoint:female		2.90***				1.64***			1.39***
		(0.11)				(0.17)			(0.05)
qinterest			0.14				−0.15		
			(0.09)				(0.11)		
qinterest:female			−0.14				−0.15		
			(0.14)				(0.16)		
qeasy				0.31***					
				(0.10)					
qeasy:female				0.001					
				(0.16)					
age	−0.01***	−0.01***	−0.01***	−0.01***	0.03***	0.01***	0.02***	−0.02***	−0.01***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.001)	(0.001)
educ	−0.12***	−0.09***	−0.12***	−0.12***	−0.48***	−0.20***	−0.43***	−0.24***	−0.19***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)	(0.03)	(0.01)	(0.01)
hhinc	−0.21***	−0.17***	−0.22***	−0.22***	−0.40***	−0.23***	−0.40***	−0.0000***	−0.0000***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.0000)	(0.0000)
full_time	0.25***	0.19*	0.25**	0.25**	−0.44***	−0.27*	−0.20		
	(0.09)	(0.10)	(0.10)	(0.10)	(0.13)	(0.15)	(0.15)		
part_time	0.16	0.08	0.11	0.12	−0.67***	−0.39***	−0.44***		
	(0.10)	(0.11)	(0.11)	(0.11)	(0.13)	(0.15)	(0.15)		
retired	−0.13	−0.12	−0.16	−0.16	−1.35***	−0.76***	−1.03***		
	(0.10)	(0.11)	(0.12)	(0.12)	(0.14)	(0.16)	(0.17)		
homemaker	0.57***	0.23	0.39**	0.38**	−0.08	0.06	−0.01		
	(0.18)	(0.18)	(0.19)	(0.19)	(0.20)	(0.20)	(0.21)		
unemployed	1.10***	1.67***	1.86***	1.86***	0.88***	1.27***	1.43***		
	(0.20)	(0.24)	(0.25)	(0.25)	(0.21)	(0.26)	(0.27)		
refresher	−0.20***	−0.11*	−0.17***	−0.17***	−1.84***	−0.75***	−1.54***		
	(0.05)	(0.06)	(0.06)	(0.06)	(0.11)	(0.12)	(0.12)		
Constant	5.28***	4.30***	5.17***	5.12***	8.52***	5.52***	8.43***	7.31***	6.68***
	(0.25)	(0.27)	(0.28)	(0.28)	(0.42)	(0.45)	(0.46)	(0.26)	(0.28)
Observations	106,856	80,425	80,416	80,413	115,969	74,641	74,632	261,374	195,107
R^2	0.11	0.18	0.11	0.11	0.03	0.08	0.03	0.12	0.15

*p<0.1; **p<0.05; ***p<0.01
Standard errors in parentheses.

Notes: Replication of Table 3 with alternative measures.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; University of Michigan, Survey Research Center, MSC, January 1978 - January 2023; own calculations

J Predicting Confidence through Rounding

Table 15: Predicting confidence through rounding

	round_inflexp_point		
	BOP-HH	SCE	MSC
	(1)	(2)	(3)
Constant	−1.55***	−1.11***	−0.37
	(0.12)	(0.09)	(0.00)
round_expint_point	0.23***		
	(0.02)		
round_debt_point		0.98***	
		(0.02)	
round_exphp_point	0.64***	1.11***	0.38
	(0.03)	(0.02)	(0.00)
age	−0.004***	0.01***	0.002
	(0.001)	(0.001)	(0.00)
female	0.39***	0.75***	0.37
	(0.02)	(0.02)	(0.00)
single	−0.09***	−0.18***	0.05
	(0.03)	(0.02)	(0.00)
educ	−0.04***	−0.21***	−0.13
	(0.003)	(0.01)	(0.00)
hhinc	−0.06***	−0.13***	−0.0000
	(0.01)	(0.004)	(0.00)
refresher	−0.14***	−0.36**	−0.15
	(0.03)	(0.16)	(0.00)
full_time	0.03	0.04	
	(0.04)	(0.03)	
part_time	−0.02	−0.06**	
	(0.05)	(0.03)	
retired	−0.10*	−0.20***	
	(0.05)	(0.03)	
homemaker	0.13	−0.11***	
	(0.09)	(0.04)	
unemployed	0.03	0.08*	
	(0.09)	(0.04)	
Observations	57,251	100,712	68,971

*p<0.1; **p<0.05; ***p<0.01

Notes: Regression coefficients of a logistic regression of demographic variables and rounding in other survey questions on the dummy to round inflation expectations. All regressions incorporate regional controls, between effects, and time fixed effects.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; ; Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; University of Michigan, Survey Research Center, MSC, January 1978 - January 2023; own calculations

K Regression in the Deciles

Table 16: Quantile regression

	Inflation expectations (12 months ahead, point estimate)				
	Bottom 20%	Bottom 40%	Bottom 60%	Bottom 80%	Full Sample
Survey: BOP-HH					
female	-0.47^{***}	-0.30^{***}	-0.03	0.12^{***}	1.32^{***}
	(0.06)	(0.04)	(0.03)	(0.02)	(0.04)
single	0.25^{***}	0.15^{***}	0.04	-0.02	-0.50^{***}
	(0.08)	(0.05)	(0.03)	(0.03)	(0.06)
age	0.004^{*}	0.01^{***}	0.01^{***}	0.01^{***}	-0.01^{***}
	(0.003)	(0.002)	(0.001)	(0.001)	(0.002)
educ	0.07^{***}	0.04^{***}	0.02^{***}	-0.001	-0.12^{***}
	(0.01)	(0.01)	(0.004)	(0.003)	(0.01)
hhinc	0.10^{***}	0.06^{***}	0.01^{**}	-0.01^{**}	-0.21^{***}
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	23,736	40,328	66,634	88,156	106,856
R^2	0.05	0.04	0.06	0.20	0.11
Survey: SCE					
female	-2.53^{***}	-1.93^{***}	-1.81^{***}	-1.17^{***}	1.69^{***}
	(0.09)	(0.06)	(0.06)	(0.05)	(0.07)
single	0.47^{***}	0.42^{***}	0.39^{***}	0.25^{***}	-0.09
	(0.10)	(0.07)	(0.07)	(0.06)	(0.09)
age	-0.02^{***}	-0.004^{*}	0.003	0.01^{***}	0.03^{***}
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
educ	0.84^{***}	0.62^{***}	0.57^{***}	0.38^{***}	-0.47^{***}
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)
hhinc	0.44^{***}	0.34^{***}	0.30^{***}	0.19^{***}	-0.40^{***}
	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
Observations	43,290	65,526	74,335	92,928	115,969
R^2	0.11	0.09	0.08	0.05	0.03
Survey: MSC					
female	-0.08^{***}	-0.13^{***}	0.04^{***}	-0.01	0.86^{***}
	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
single	-0.10^{***}	-0.12^{***}	-0.11^{***}	-0.11^{***}	-0.004
	(0.03)	(0.02)	(0.01)	(0.01)	(0.03)
age	0.001^{**}	-0.001^{**}	-0.004^{***}	-0.004^{***}	-0.02^{***}
	(0.001)	(0.0004)	(0.0004)	(0.0004)	(0.001)
educ	0.07^{***}	0.09^{***}	0.09^{***}	0.11^{***}	-0.24^{***}
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
hhinc	0.0000^{**}	-0.0000	-0.0000^{***}	-0.0000^{***}	-0.0000^{***}
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Observations	73,834	143,278	199,151	213,445	261,375
R^2	0.06	0.06	0.04	0.04	0.12

*p<0.1; **p<0.05; ***p<0.01
Standard errors in parentheses.

Sources: Research Data and Service Centre (RDSC) of the Deutsche Bundesbank, BOP-HH, April 2020 - September 2022; Federal Reserve Bank of New York (FRBNY), SCE, June 2013 - November 2020; University of Michigan, Survey Research Center, MSC, January 1978 - January 2023; own calculations